

**WHY U.S. STATES BECAME LEADERS IN CLIMATE AND
ENERGY POLICY: INNOVATION THROUGH COMPETITION IN
FEDERALISM**

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by

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FEDERALISM**

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SUMMARY

The competitive federalist system facilitated state leadership and the diffusion of innovative policies that addressed climate change and energy issues in the absence of comprehensive federal action at the start of the twenty-first century. In a competitive federalist system state governments and their politicians challenge one another horizontally and the federal government vertically for legislative credit and functional authority on relevant policy issues. What drove state-level climate and clean energy leadership from 2001 to 2012? This dissertation develops three competitive federalism-based hypotheses for analysis: (H1) A national, bipartisan network of ambitious, entrepreneurial governors drove climate and clean energy policy innovation from 2001 to 2012; (H2) the State Energy Program Recovery Act resources reduced the policy adoption gap between early enactors and laggards in clean energy financing and regulation; (H3) and justification for climate and clean energy activities in the states shifted from environmental to economic rationales from 2001 to 2012 (Figure ES1). While competitive federalism theory has centered on both fiscal and ideological considerations driving innovation in the policy environment, the experience of climate change policymaking and clean energy actions at the state level during the period under consideration reveals a clear partisan divide in policymaking within this domain.

Conceptual Model:
Competitive Federalism Drives Innovation in Public Policy

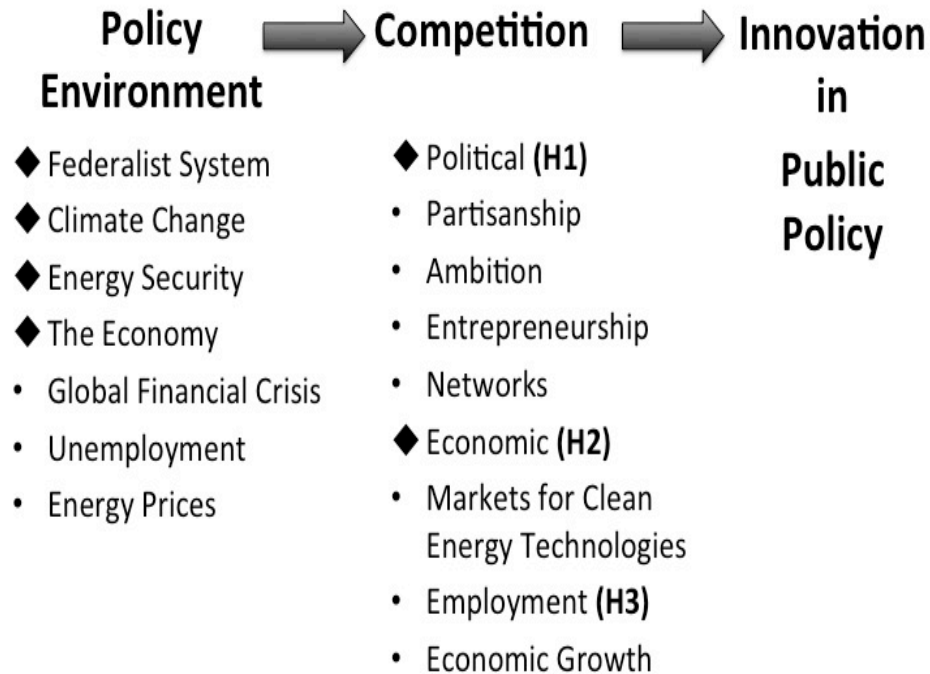


Figure ES1- Conceptual Map of Hypotheses

Supreme Court Justice Louis Brandeis (1932) wrote, “a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country [...]” This research will analyze the policy experiments and the causes of policy innovation and policy leadership within institutions in states across the nation in tackling the interrelated challenges of climate change, energy security, and economic development. The results show that the laboratories of democracy are also laboratories of opposition, with state governments and their executives using the institutional authorities and policy tools at their disposal to challenge the status quo in climate and energy actions at the federal level- and in laggard states- with both innovative program design and regulatory regimes.

Table ES1 - Hypotheses' Data, Statistical Methods, and Analysis Tools

Hypothesis	Data	Statistical Methods	Analysis Tools
1	State Energy Policies, NGA Information, State of the State Addresses, Political and Demographic Data	Event History Analysis, Network Analysis, Content Analysis	Excel, STATA
2	State Energy Policies, ARRA SEP Plans	Indexing of Policies, Content Analysis	Excel, STATA, Nvivo
3	State Energy Policies, State of the State Addresses, Economic Data	Content Analysis, Input-Output Modeling, Regression Analysis	Excel, IMPLAN, Nvivo, STATA

Federalism has been a constant driver of progress and source of tension throughout the history of the United States. Federalism can be unequal and inefficient, but it can also suit local resources and needs and foster effective competition (Tiebout 1956; Gray 1973; Polsby 1984; Oates & Schwab 1991; Peterson 1995; Wildavsky 1998). Solutions to climate change and global energy security are particularly confounding within the contemporary governance structures. In light of federal inaction described in the academic literature and first-hand practitioner accounts (for example Doris & Taylor 2009; Lutsey & Sperling 2008; Rabe 2006; 2008; 2011; Richardson 2008), states achieved a level of adoption and investment in relevant policy innovations that is beyond the policy environment of other jurisdictions at the time of enactment and offers a policy model for receptive innovators to become leaders in this policy subsystem. Table ES1 above outlines the mixed-methods approach, including content analysis and event history statistical methods, for analyzing the hypotheses as to why this leadership existed during the period in question.

Hypothesis 1: Political Competition

The evidence proved counter to the political competition hypothesis. At the top of the state government hierarchy- regardless of the bureaucratic design of the state's energy policy functions- is the governor. Morehouse and Jewel (2003) indicate that the "governor is responsible for defining the issues and making the commitments that form the basis of his or her legislative program." Adopting new policies is vexing within modern political institutions, particularly for issues such as climate and clean energy that often fail to reach the top of the policy agenda. Governors across the country, regardless of region, party, or federal political ambition advanced policy proposals in their State of the State Addresses to encourage the deployment of programs and technologies designed to advance the clean energy economy and mitigate climate change. Through the National Governors Association and other venues for gubernatorial collaboration, governors and their states adopted relevant policies. Although, for example, Republican governors who ran for president in 2012 were at the forefront of this leadership, there is not evidence to conclude that a bipartisan group pushed these goals. The event history analysis of gubernatorial policy proposals from State of the State addresses and adopted policy in the states found heavy partisanship, as the political party variables were the most significant determinant of energy efficiency, renewable energy, and climate change policy leadership. This includes both the party of the governor himself or herself and the state's political culture as defined through the previous Electoral College votes for president, with the Democrats leading the way. It shows that even as states are a venue for action, the national tensions prevalent in Washington that prevented comprehensive climate and clean energy policy reforms drive the laboratories of opposition.

Hypothesis 2: Economically Rational Competition

There is evidence of horizontal economic competition and policy diffusion, but the Recovery Act did not in itself reduce the adoption gap. The adoption gap between early enactors (leaders) and laggards in the diffusion of innovative public policies is a function of political values, financial resources, capacity, time, and models of innovation. The American Recovery and Reinvestment Act (ARRA) of 2009 provided a financial windfall to alleviate the barrier of struggling state energy coffers in advancing climate and clean energy action in leading and lagging states. Its authors considered ARRA the biggest energy bill in history and the first step of a national carbon mitigation strategy (Grunwald 2012). In order to analyze the second hypothesis, a new index of State Energy Program under ARRA related policies- including regulatory requirements, the size of financial incentives for clean energy, and actions to mitigate climate change- divided 20 pre-ARRA leaders from 30 laggards. There was not, however, clear evidence that states that had fallen behind looked for models of innovation from early enactor states as how to operate their programs based on the empirical content analysis of ARRA plans submitted to the US Department of Energy. ARRA planning resulted in many leading and lagging states improving the stringency of their building codes and developing new financially sustainable mechanisms for funding energy programs, but there is not evidence that it has a causal impact from a horizontal competitive federalist perspective that it closed the adoption gap. While ARRA drove the expansion of regulation, reducing the constraint of financial resources was not enough to close the gap between the states that had different political values and differing capacity to carry out innovative policy designs in the brief period of this intergovernmental windfall.

Hypothesis 3: Policy Rationale for State Intervention

Economic and employment considerations were a major part of clean energy policy, but there was not evidence of a full shift in rationales. The basis of ARRA's energy titles was economic development and job growth through energy related expenditures, with green jobs as the key co-benefit under consideration. Input-output analysis of jobs coefficients using IMPLAN shows that investments in energy efficiency and renewable energy technologies to displace fossil fuel consumption are productive for expanding job growth, even in states with large fossil fuel industries. The economic potential of clean energy resources justified relevant actions with opportunities for new employment and increased labor income through energy efficiency and renewable energy based on the bills of goods analyzed with IMPLAN modeling, even as evidence of a clear shift in rationales is limited- as the attention to this co-benefit was a product of political and financial opportunity. As with the other hypotheses, leadership occurred within the key institutions of state governance, federal-state relations, state-state relations, and competitive federalism within a challenging economy to address a wicked, global problem, but reasons varied across the time period- limiting universal conclusions on generalized trends for why states were leaders.

Despite the clear vertical tensions between the state and federal governments, and the partisan tensions among the state and federal officials competing for power and authority, the system spurs innovation. The innovation is rooted in partisan ideologies and may miss economic opportunities due to competing values, but the experimentation in the democratic laboratories of opposition is also finding creative and flexible means to achieve the multiple goals of the pluralistic interests across the United States. Many of

the innovative financing mechanisms rapidly spread across receptive states because they combine concern for the environment with concern about economic development.

Interested states are an effective venue for facilitating the expansion of energy savings and carbon dioxide reduction programs that the federal government does not have the will or ability to enact. Despite the hypotheses notwithstanding the multiple methods of analysis, this research makes useful contributions to an understanding of state energy policy leadership in addressing the importance of partisanship, the disparities among leaders and laggards, and opportunities to expand economic development through clean energy program and climate action in the post-Recovery Act period. Understanding these governance institutions in the federalist system are key to understanding the United States' role in tackling this global commons problem.

Chapter 1

Introduction

What drove state-level climate and clean energy leadership from 2001 to 2012? Over two centuries ago in the *Federalist* #46, James Madison (1788) asked with regards to state politicians, “And if they do not sufficiently enlarge their policy to embrace the collective welfare of their particular State, how can it be imagined that they will make the aggregate prosperity of the Union, and the dignity and respectability of its government, the objects of their affections and consultations?” Looking out on the vast wilderness of North America, President Madison did not envision a future where politicians and bureaucrats in state governments would lead beyond their own borders in an issue not just of national interest, but also of international importance. The procedures and division of responsibilities in the Constitution that the future President Madison fathered, however, have afforded the authority and flexibility to state governments to innovate in climate and clean energy policy in the absence of strong federal action. In a dissenting Supreme Court opinion last century, Justice Louis Brandeis (1932) wrote, “a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country [...]” This research will analyze the policy experiments in states across the nation in tackling the interrelated challenges of climate change and energy security at the start of the twenty-first century. The findings indicate that the laboratories not only produced innovation, but also served as laboratories of opposition to one another and Federal policies.

These experiments, dissemination, and diffusion of public policies occurred in a competitive environment among the states and between the states and the federal

government, driving the leadership. Berry & Berry (2007) define leaders as “pioneers,” who increase the likelihood of adoption in other states through a hierarchical model of diffusion. Boushey (2010) ranks states based on receptivity to innovation, assigning a score from 0 to 1 for the relative speed of response to a series of policy innovations. Posner (2010) notes that state policy adoptions do not always result in full implementation, but that state innovation can push federal action. For the purpose of this analysis, leadership is a level of adoption and investment in relevant policy innovations that is beyond the policy environment of other jurisdictions- states or the federal government- at the time of enactment and offers a policy model for receptive innovators.

This competitive federalism existed as the state governments and their political leaders challenged one another horizontally and the federal government vertically for legislative credit and functional authority on relevant policy issues (Shannon & Key 1989; Kincaid 1991; Wildavsky 1998; Mintrom 2009; Nicholson-Crotty & Theobald 2011). Legislative federalism and political competition arose from politicians trying to address an issue of political concern, such as climate and clean energy problems. Congress is often the focus of intensive ideological squalor (Mann & Ornstein 2012), but these divisions over national debates on healthcare reform, reproductive rights, and climate and clean energy policy have manifested in state capitals. Bulmen-Polzen (2014) writes “In recent years, states have challenged federal law regulating marriage as an intrusion on state sovereignty, adopted their own versions of failed federal legislation regarding greenhouse gas emissions and the funding of Planned Parenthood, administered federal immigration law in a decidedly uncooperative manner, and more.”

The economic competition under functional federalism this dissertation considers is that idea that states- with federal cooperation- aiming to formulate effective policy at the most appropriate institutional level while competing with one another in the political, policy, and economic development “marketplaces” (Peterson 1995, Wildavsky 1998). The governors and their states, as rational actors considered in this policy environment, had a rationale for public intervention creating horizontal and vertical competition in climate and clean energy policy, and driving the political and economic competition (Stone 2002). Federalism can be unequal and inefficient, but it can also suit local resources and needs and foster effective competition (Tiebout 1956; Gray 1973; Polsby 1984; Oates & Schwab 1991; Peterson 1995; Wildavsky 1998). This study will examine and explain the political and economic considerations of state policymakers, particularly governors, and the changes in political dialogue and policy action throughout the decade, focused on carbon mitigation aspirations, incentives, and regulations and clean energy programs. While competitive federalism scholarship has often centered on fiscal federalism, current political dynamics require incorporation of partisan federalism into the theory (Haeder & Weimer 2013; Rigby & Haelswedt 2013; Bulman-Pozen 2014).

The federal government imposed national standards through the Clean Air Act and Clean Water Act in the 1970s because states were undercutting one another in environmental regulation in a perceived “race to the bottom” to avoid economic disadvantages (Revesz 1992, Fredericksen & Millimet 2002, Brown & Sovacool 2011). Three decades later, with Washington failing to develop a comprehensive climate policy, several states took actions that far exceeded minimum standards. The hypotheses for this analysis will focus on the political and economic consideration, particularly of the state

governors, that facilitated these developments and the strategic interaction between and among the states and the Federal government. After outlining the purpose of this study, providing a description of the twelve years of climate and energy policy under consideration and evidence of state leadership from the scholarly and practitioner literature, and developing a theoretical framework, this mixed-methods analysis will test three hypotheses of competitive federalism:

H1. A national, bipartisan network of ambitious, entrepreneurial governors drove climate and clean energy policy innovation from 2001 to 2012.

H2. The State Energy Program Recovery Act resources reduced the policy adoption gap between early enactors and laggards in clean energy financing and regulation.

H3. Justification for climate and clean energy activities in the states shifted from environmental to economic rationales from 2001 to 2012.

The purpose of this work is to provide an improved understanding of the institution of federalism in mitigating one of the key global governance challenges of today; one that requires activity at every level of government. It will draw on recent history to see the changes and expand upon policy diffusion analysis and the public policy literature in general to enhance the understanding of politics, leadership, and economic considerations in strategies that encourage policy innovation. It will also explore the role of governors and gubernatorial interaction in the policy process. For a practical application, it will address how to encourage the state level laboratories of

democracy- or, perhaps the laboratories of democratic opposition- to continue to pursue effective policy experiments that can encourage policy progress across the nation and improve intergovernmental relations. The past twelve years have shaped the course of this public policy problem and solution space in the structural context of American politics

CHAPTER 2

PURPOSE OF STUDY

While competition and diffusion in federalism have existed for centuries, the twenty-first century energy and environmental challenges are a modern dilemma for American society. The energy challenges today are “wicked” problems, in that they lack simple, clearly correct solutions to the on-going dilemmas requiring action under conditions of uncertainty (Rittel & Webber 1973). The Intergovernmental Panel on Climate Change (IPCC 2007) for the United Nations and the Stern Review (Stern et al. 2006) for the Government of the United Kingdom note the global anthropogenic causes and global risks to the health, welfare, and the economy of the planet and human society from energy consumption of carbon-emitting fuels. The additional dimensions of energy prices and energy security add to this global challenge beyond just the environmental impacts (Brown & Sovacool 2011). Hirsch & Norton (2012), borrowing from the philosophy of nature of Aldo Leopold (1949), argue that climate change efforts require policymakers to be “thinking like a planet,” in this collective undertaking by working outside traditional geopolitical boundaries. Achieving meaningful action in the American states is both institutionally vexing but also a significant opportunity to improve the status of political leaders, the functionality of federalism, and maximize benefits and co-benefits of stringent and effective public policies.

The contemporary policy subsystem of climate and clean energy exists in the context of fraught political arena that the ideologically divergent political parties are shaping. Bulmen-Polzen (2014) defines partisan federalism as “political actors' use of state and federal governments in ways that articulate, stage, and amplify competition

between the political parties, and the affective individual processes of state and national identification that accompany this dynamic.” While particularly prominent in the hybrid model of federal-state implementation of the controversial insurance markets of the Affordable Care Act (Haeder & Weimer 2013; Rigby & Haelswedt 2013), partisan divisions are also prevalent from problem definition, to calls for action, to implementing new financing opportunities or regulations on clean energy and climate change mitigation.

There are also a multitude of barriers beyond politics towards developing clean energy policies and addressing climate change. Jamieson (2012) philosophizes that “[...] greenhouse warming will have impacts that are so broad, diverse, and uncertain that conventional economic analysis is practically useless.” From a practical perspective, the Committee on Climate Change Science and Technology Integration (CCCSTI 2009) recognizes cost effectiveness of technology, fiscal barriers, regulatory barriers, statutory barriers, intellectual barriers, and other barriers (including incomplete and imperfect information) to managing the emissions and supply and demand of energy. Brown and Chandler (2008) note the difficulty of mismatched and incongruent policies among multiple jurisdictions. Academics, policymakers, firms, and consumers, however, continue to research, develop, and deploy mechanisms to advance new technologies and actions and overcome the market failures.

Environmental challenges and natural resource scarcity are not new in capitalist societies. Polanyi (1944) argues that “[economic] production is the interaction of man and nature,” but warns “The economic function is but one of many vital functions of the land.” He offers historical examples of small-scale regulation of the environmental

commons, but his work does not consider a worldwide market challenge. William Nordhaus (2005), one of the most prominent scholars in the economics of climate change, declares, “The greenhouse effect is the granddaddy of all public goods problems.” Protecting the environment, correcting externalities, understanding the trade-offs and maintaining or improving the standard of living requires the adoption and implementation of public policies within the political system and institutions of governance.

The United States has experience with a diverse array of energy and environmental policies. The Clean Air Act, for example, has led to decreasing pollution across the country through regulation of National Ambient Air Quality Standards (Portney 2000). Stavins (2000) highlights the success of market-based mechanisms that encourage beneficial behaviors for the environment through the correction of externalities, including the acid rain reduction program. These programs suffer when there are inaccurate predictions about the pollutants or emissions, design problems, or limitations in the firms. Shorgren and Toman (2000) add that benefits, cost, and uncertainty are important in the design of climate change policies. Norton (2005) encourages policy experimentation to tackle wicked problems. While the institutional setting may not follow Norton’s theory of adaptive management, the states have adopted command-and-control and market-based policies to meet climate and energy challenges, learning from themselves and each other within the context of competitive federalism.

Federalism has been a constant driver of progress and source of tension throughout the history of the United States. Federalist #46 notes the limitation of the federal authorities but also indicates an opportunity for expansion of federal power where

voters and politicians find it prudent (Madison 1788). Federalism can be unequal and inefficient, but it can also suit local resources and needs and foster effective competition (Tiebout 1956; Gray 1973; Polsby 1984; Oates & Schwab 1991; Peterson 1995; Wildavsky 1998). From healthcare, to education, to economic regulation, the division of powers remains a contentious process, even in today's national elections (Katz 2012). Global commons problems, such as climate change and energy security, further confound these issues with debate over responsibilities from the local to the international levels. Whether or not the United Nations Framework Convention on Climate Change (UNFCCC) has or can ever provide an effective global regime, it will always require sub-national buy-in and policy action to meet carbon mitigation goals and a polycentric approach in which overlapping jurisdictions handle problems at the optimal governance level (Andersson & Ostrom 2008; Brown & Sovacool 2011). Although Stone (2002) comments, "arguments about federalism tend to be abstract and metaphorical," the federalist structure is a critical political structure for how the world's largest economy will meet, or fail to meet, the challenges of the climate and clean energy future.

Solutions to climate change and global energy security are particularly confounding with the contemporary governance structures. In a discourse on deliberative policy analysis arguing for greater understanding of non-state and sub-state actors, Hajer (2003) declares, "The constitutional rules of well-established classical-modernist policies do not tell us about the new rules of the game." Federalism, distinct from simple decentralization and devolution, was an American creation and it has evolved throughout the history of the country. Proponents of views from across the political spectrum have used the institution to push their agendas (Nathan 2008). Shannon and Kee (1989)

employ analysis of public expenditures to divide the history of American federalism: “Constitutional Federalism” from 1789 to 1929 with limits on government, the post New Deal order of “Centralizing Federalism” after 1929 and the Second World War, and “Competitive Federalism” starting in 1978. In this regard, the authors are describing a federalist system whereby there is competition between the state and federal governments as they argue that due to fiscal constraints, “The essence of Competitive Federalism is that now Washington policymakers as well as state and local officials must go back, hat-in-hand, to a common source -the nation’s taxpayers- when additional tax revenue is needed” (Shannon & Kee, 1989). Since publication of this article and particularly in the last decade, competitive federalism has taken on both fiscal and partisan dimensions. For all of the efforts to shift paradigms, however, the federalist Constitution remains the basis of American government and the basis for understanding the political actors in the American system.

Competition is a driver of politics and economics in capitalistic democracies. Success, progress, and prosperity arise through electoral wins, economic growth, and adjusting strategy to meet the challenges of partners and rivals, whether it is competing for votes or competing for money. In a federalist system, competition between the states and the federal government and amongst the states is part of the institutional structure. Buchanan (1995), in a conservative polemic, describes federalism as an “ideal political order” in allowing states to challenge the central governing authority. In a seminal article, Tiebout (1956) argues, “The consumer-voter may be viewed as picking that community which best satisfies his preference pattern for public goods.” Although this research will not address individual choices for moving into a desirable community, it will explore

how states and their governors develop policies that meet the social preferences of the population and the economic development needs through interaction.

Rabe (2011) highlights the history of climate change federalism. From 1975 to 1997 both federal and state policies for mitigating greenhouse gas emissions were largely “symbolic,” lacking in useful action towards handling this problem. For the decade afterwards, however, there was state domination in this subsystem with regional compacts and other policy mechanisms. With the Supreme Court decision about greenhouse gas regulation in 2007 and changes in Congress and the White House, the current situation in Rabe’s typology is “contested federalism,” as the different units of government explore different governing mechanisms. Derthick (2010) uses the term “compensatory federalism” for the preferred system in environmental policy. She declares, “federalism works when governments at one level of the system are able to compensate for weaknesses or defects at another level.” Posner (2010) says that through vertical diffusion state-level policy adoptions are spurring federal action. The roles of the state and Federal governments are in flux not just in the academic literature, but in the public policy discourse of political leaders at all levels of government. There is a competition in the policy arena for the state and federal governments and this study will show how the competition facilitated opposition and change.

At the top of the state government hierarchy is the governor. Morehouse and Jewel (2003) indicate that the “governor is responsible for defining the issues and making the commitments that form the basis of his or her legislative program.” Their review, however, also indicates that formal gubernatorial powers vary across the nation based on tenure in office, separately elected executive-branch officials, appointive power,

budgetary power, and veto power. Gubernatorial decision-making and internal and external factors of state policies are a vibrant area for research and analysis. Governors staked their political futures climate and clean energy policy, often challenging the federal government as states sought prosperity and leadership through climate and clean energy policies. While each governor's office and its occupant are unique, governors are policy leaders and internal and external advocates for their states (Brooks 1961; Ronsone Jr. 1982; Beyle & Munchmore 1983; Harrigan 1998). Stone (2002) notes that all politicians must meet the dual goals of successful policy and successful politics.

Governors are members of multiple interstate coalitions and committees. Some of these are specifically regional (i.e. the Midwest Governors Association) or specifically partisan groups (i.e. the Republican Governors Association) that facilitate network development and policy learning. While regional considerations were not significant, party played a key role in policymaking. This analysis will show a minor but useful role for national networks developed through specifically nonpartisan organizations, such as the Energy and Natural Resources Committee of the National Governors Association or the Governors' Ethanol Coalition. Posner (2009) states that networks "become a valued and essential adjunct and tool of governance in environmental governance." They are also a key venue for the exchange of ideas and the diffusion of public policies (Balla, 2001). This analysis will explore networks to identify a class of policy entrepreneurial governors in this policy subsystem. Policy entrepreneurs, as a type, are governors who can use their political resources to achieve internal legislative victories and engage in the policy diffusion process through external networks (Roberts & King 1991, Kingdon 1995, Mintrom 1997, Harrigan 1998). This work will help understand the spread of

policy innovations in a highly-partisan nationwide diffusion and expand the understanding of policy entrepreneurship at the upper levels of the American political hierarchy. In addition, it will build on the work of Bulmen-Polzen (2014) to provide empirical evidence for her assertion that partisan opposition is a source of federalist conflicts.

Behind this state level entrepreneurship, may have been ambition. Schlesinger (1966) writes, “Ambition theory focuses on the ways in which men cooperate- form organizations, coalitions, or factions- to serve their political ends. [...] At the same time ambition theory can be brought to bear on overt acts such as the votes of a legislator or policy proposals of a governor.” Dahl (1961) encourages scholars to look into the role of the politician in governance. Brooks (1961), however, writes of governors, “They are key figures not only in the quadrennial tug of war for the presidency, but also the arduous day to day political struggle.” Thus, operationalization of the first hypothesis- that a national, bipartisan network of ambitious, entrepreneurial governors drove climate and clean energy policy innovation from 2001 to 2012- will provide an understanding of the actors in collaboration and competition that led to leadership.

The second hypothesis will further explore the results of policy diffusion through the unique circumstances of the American Recovery and Reinvestment Act of 2009 (ARRA). The Recovery Act’s authors considered ARRA the biggest energy bill in history and the first step of a national carbon mitigation strategy (Grunwald 2012). The Recovery Act increased federal funding to states for energy efficiency, renewable energy, and energy assurance programs from \$25 million in formula State Energy Program (SEP) funding for Fiscal Year 2009 to \$3.1 billion for the ARRA period. For the decade before

this stimulus investment, without comprehensive federal intervention, states approached the climate and clean energy challenges with varied levels of concern, stringency, and capacity for relevant policies. By creating a pre-ARRA index and analyzing all ARRA SEP plans in the context of competitive fiscal federalism, this study will test the hypothesis that the SEP ARRA resources reduced the policy adoption gap between early enactors and laggards in clean energy financing and regulation. The findings will reveal that while the coercive impact on regulation did help close the gap for building codes the resources did not lead to a change in the financing policies that separated leaders and laggards.

Peterson (1995) says that in a successful competitive federalist system vertically and functionally the federal government will focus on redistribution while the states will concern themselves with economic development. Buchanan (1995) argues that the competitive federalist system should allow for an “exit” option for the states. Using Wildavsky’s (1998) birthday cake metaphor for competitive federalism, the federal government through the SEP ARRA was providing the redistributive resources for consumption while the states were choosing the ingredients and designing this cake of clean energy policies to their own tastes. Thus, the competition was horizontal in designing SEP ARRA strategies. Under this hypothesis, while laggard states had the advantage of new resources to overcome the barriers to the adoption and investment for closing the adoption gap, the time-constrained early-enactors did not have new models to quickly develop and implement for the Recovery Act programs. In a competitive environment, some states will lead and some states will be very slow to innovate, but redistribution could have pushed the rapid expansion of innovation into new jurisdictions

had there not been time, capacity and political pressures impacting the program development and implementation.

Figure 1 provides an equation for understanding the second hypothesis, that the State Energy Program Recovery Act resources reduced the policy adoption gap between early enactors and laggards in clean energy financing and regulation. The adoption gap between early enactors (leaders) and laggards in the diffusion of innovative public policies is a function of political values, financial resources, capacity, time, and models of innovation. The first step in this longitudinal research is to examine the growing adoption gap in relevant financial and regulatory policies in the decade leading up to the Recovery Act. Berry and Berry (2007) describe the leader-laggards model in their work on policy diffusion. Policy analyses, program evaluations, and governmental reports have indicated the presence of leaders and laggards in the energy and environmental subsystem. Rabe (2008), for example, provides a clear leader-laggard dichotomy as he divides states based on the number of policies they have adopted out of an RPS, carbon tax, renewable fuel standard, carbon cap-and-trade, emissions target, emissions reporting, and vehicle emissions standards at the level of California. In addition, he also includes formal support of Massachusetts and its support of carbon dioxide regulation in the 2007 Supreme Court case of *Massachusetts v. Environmental Protection Agency (EPA)* as one of the eight policies to count for adoption. This study will focus on ARRA-related and policies and expand the analysis to also understand relative levels of investment.

$$\text{The Adoption Gap} = f(\text{Political Values; Financial Resources; Capacity; Time; Models of Innovation})$$

Figure 1- The Adoption Gap

The second part of the research outlined in Figure 1 is the analysis of ARRA SEP plans acquired through a Freedom of Information Act request to establish the shrinking adoption gap. The 50 states, 5 territories, and the District of Columbia receive funding through a formula (the vertical redistribution) in the Code of Federal Regulations (10 CFR Part 420), with approximately one-third of funding divided based on population, one-third based on energy consumption, and one-third divided equally. To receive the annual funding, each state must submit a State Energy Plan and provide 20% cost-share through state resources- although the Recovery Act removed this requirement for ARRA accounts - in addition to additional intergovernmental regulations. The funding is flexible, allowing for programs that promote energy efficiency, renewable energy, energy security, transportation efficiency, energy education, and other relevant activities. There were, however, limitations on the ARRA funding- the opportunity for states to opt-out as Buchanan (1995) encourages. Each of the governors needed to sign a letter assuring the Secretary of Energy that his or her state would adopt more stringent building codes, ensure that the utility incentive structure in the state encouraged energy efficiency

investments from utilities through decoupling or similar mechanisms, and prioritize existing energy efficiency and renewable energy programs (Grunwald 2012).

Understanding the influence of this windfall on early-enactors and laggards in this time limited but resource rich moment has both theoretical implications and implications for the future of climate and clean energy policy. Although the financial resources variable diminished between leaders and laggards for the adoption gap and laggards had access to models of innovation from the leaders, the political values and capacity to develop a clean energy economy remained a division between the states in the study. The findings will show that the Recovery Act has an impact, particularly with regards to the gubernatorial letter requirements, but it was too brief and too small to fully mitigate the different sides of the adoption gap.

The final hypothesis delves into the rationale for the policies put into place: Justification for climate and clean energy activities in the states shifted from environmental to economic rationales from 2001 to 2012. Key national and global events, particularly the Democratic takeover of Congress in 2007 and the White House in 2009 and the financial crisis that still dominates the headlines, altered the policy landscape across all levels and subsystems. Rabe (2011), for example, specifically notes a shift in 2007. Economic development has served a key rationale for clean energy policies at the federal level. “Green jobs” have been on the policy agenda throughout the past several years. Vice President Joseph Biden (2009) defined green jobs as careers that “provide products and services that use renewable energy resources, reduce pollution, and conserve energy and natural resources.” President Barack Obama has framed climate change and energy security as economic matters (Rosencranz & Conklin 2010). *Green*

Recovery, an economic white paper from the Center for American Progress, provided a justification for the clean energy titles of the Recovery Act (Pollin et al. 2008). The report's input-output model predicted that a \$100 billion national investment in energy efficiency and renewable energy could create 2 million green jobs. According to the authors, shifting consumer expenditure from fossil energy costs, putting financial resources towards industries that have limited employment opportunities to more cost effective and labor-intensive energy technologies can improve the American economy.

While Frederiksson and Millimet (2002) focused on the environmental outcomes as the rational goal of environmental policy, the potential economic benefits can drive the strategic interaction and diffusion. Rabe (2011) shows, for example, a state that does not produce automobiles may implement fuel economy standards because its citizens would benefit from lower fuel costs while businesses in another state would be saddled with the compliance costs. The IPCC (2007) indicates that carbon mitigation policies can have economic, environmental, and social co-benefits in their implementation. Not every economic development opportunity through energy is climate friendly. Geri and McNabb (2011) proclaim, "They [state regulators] are pinned between conflicting pressures to protect the environment, but also to say 'yes' to energy projects that offer badly needed economic development to cash-strapped communities." The hydraulic fracturing (fracking) technological advancements to access natural gas reserves and the Keystone Pipeline debate of recent years have shaped the dialogue. As Daniel Yergin (2012) recently editorialized, "This new reality requires a new way of thinking and talking about America's improving energy position and how to facilitate growth in an environmentally sound way [...]". Although the focus of this analysis is on energy

efficiency, renewable energy, and alternative carbon mitigation techniques, advances in fossil fuel access are certainly part of the policy environment in which policy learning, policy diffusion, and policy adoption occur.

To understand the rationale for the rational choices of the rational policy actors in the states, this work will seek to connect the words of governors in the State of the State Addresses with the economic development potential of the policies. Habermas (1973) argues for the importance of communication and discourse in the public sphere. State of the State Addresses are a useful window into gubernatorial initiative, as they serve as a key indicator at the start of the legislative session into gubernatorial priorities for the term (Morehouse & Jewell 2004). Heidbreder (2012) and Coffey (2005) both used State of the State Addresses to analyze agenda setting and gubernatorial policymaking. To augment the content analysis and match actions to the words, this analysis will compare coding of statements to the eventual policy adoptions and potential economic development impact as shown through input-output tables.

Figure 2 provides a conceptual mapping of the hypotheses to show how the empirical analysis will attempt to address the premise that competitive federalism drove climate and energy policies in the states from 2001-2012. The policy environment- including the institution of federalism- facilitates political and economic competition, which drive innovation in (climate and energy) public policy. The elements of this graphic derive from the theory on competitive federalism (which includes legislative and functional competition) and point to the idea that the elements of this concept (H1 & H2), through rational policy actors (H3), drove state climate and energy policies for the period under consideration. Legislative federalism and political competition arose from

politicians trying to address an issue of political concern, while the economic competition under functional federalism was the states (with federal cooperation) aiming to formulate effective policy at the most appropriate level while competing with one another in the political, policy, and economic development “marketplaces” (Peterson 1995, Wildavsky 1998). The rational actors considered in this policy environment (governors and states) had a rationale for public intervention creating horizontal and vertical competition in climate and clean energy policy, and driving the political and economic competition (Stone 2002). An assumption for further consideration is that there was also a connection between politics and economics in climate and energy policymaking at the state and federal levels in the period under consideration. Defining leadership as a level of adoption and investment in relevant policy innovations that is beyond the policy environment of other jurisdictions (states and/or the federal government) at the time of enactment and offers a policy model for receptive innovator, partisan considerations dominated the political competition (H1), the economic competition (H2), and the rationale for intervention (H3) in driving the discourse and policymaking that led to the state leadership in climate and clean energy.

Conceptual Model:
Competitive Federalism Drives Innovation in Public Policy

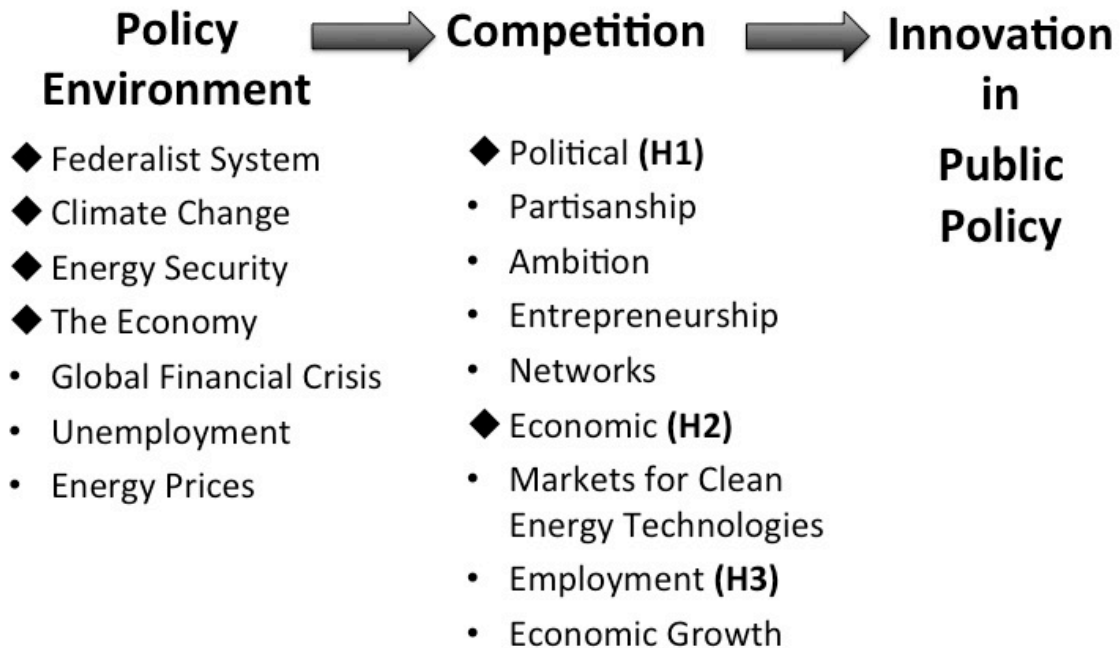


Figure 2- Conceptual Map

The next section will describe the situation in American climate and energy policy throughout the period under consideration. The literature review will then expand the theoretical framework and develop the methods to test the hypotheses. It will also establish leadership in the states through academic and other resources. Analysis by hypothesis will lead to a discussion and conclusions with implications for climate and clean energy policies and American federalism that can improve scholarly and practitioner efforts and frame future studies. As attempts to improve policies in this area expand, academics, policymakers, and the general public ought to understand the implication of constitutional federalist systems in the climate and energy future. In her Nobel Prize acceptance speech, Elinor Ostrom (2010) said, “Extensive empirical research

leads me to argue that instead, a core goal of public policy should be to facilitate the development of institutions that bring out the best in humans.” There is hope that this research will not only will strengthen understanding of polycentric approaches to climate change and energy security, it will also aid in improving federalist systems under the strain of intense partisanship for the real world challenges of the wicked global problems of the twenty-first century.

American Climate and Energy Policy 2001-2012

A review of the story of American climate and energy policy from 2001 to 2012 provides the context to understand the forthcoming analysis. Section 701(a)(2) of the American Clean Energy and Security Act (ACES) of 2009 (also known as the Waxman-Markey Bill), which passed the House of Representatives during the 111th Congress, a key moment for the relevant policy debate during this era, summarized the science:

Reviews of scientific studies, including by the Intergovernmental Panel on Climate Change and the National Academy of Sciences, demonstrate that global warming is the result of the combined anthropogenic greenhouse gas emissions from numerous sources of all types and sizes. Each increment of emission, when combined with other emissions, causes or contributes materially to the acceleration and extent of global warming and its adverse effects for the lifetime of such gas in the atmosphere. Accordingly, controlling emissions in small as well as large amounts is essential to prevent, slow the pace of, reduce the threats from, and mitigate global warming and its adverse effects.

While this bill failed to advance in the United States Senate and climate skepticism still exists throughout American political discourse (Hoggan 2009), climate scientists strengthened their consensus-based argument on the dangers of anthropogenic climate change and the imperative of greenhouse gas mitigation (IPCC 2007) from 2001 to 2012. The Academy Award winning 2006 documentary *An Inconvenient Truth* from former Vice President Al Gore and other popular media led futurist Bruce Sterling (2007) to opine, “Green will never get any sexier than it is in 2007,” as climate change issues went mainstream.

Climate change, however, was not the only energy policy challenge. With the attacks of September 11, 2001, the “War on Terror,” and unstable regimes in energy-rich countries, energy security remains an imperative (Brown & Sovacool 2011). While the nation did not experience the gas rationing of the 1970s, there was a sharp increase in the average price of gasoline, from \$1.46 per gallon in 2001 to \$3.68 per gallon in 2012 with

increases in oil prices and fluctuations in the global economy (EIA 2013). In addition, electric reliability became a concern with deregulation-related brownouts in California in 2001 and the Northeast blackout of 2003. At all levels of governance, the fuels that power the economy and society remained a key consideration for policymakers.

At the federal level, two comprehensive energy bills became law during the Bush Administration, the Energy Policy Act of 2005 (EPAAct 2005) and the Energy Independence and Security Act of 2007 (EISA) after the Democratic Party took control of Congress. In his memoirs on his presidency, George W. Bush (2010), the oilman turned Commander-in-Chief, wrote “In my 2006 State of the Union Address I said that America was ‘addicted to oil’ - a line that didn’t go over so well with my friends back in Texas.” He describes the Kyoto Protocol as “flawed” with regards to its minimal requirements for China and India and the economic consequences of the international climate regime the United States was one of the few nations not to ratify, but argues that he had been “willing to be constructive with German Chancellor Angela Merkel at the 2007 Group of Eight (G8) summit on these issues.

President Bush had arrived in Washington, DC in early 2001 having created an effective policy environment for the deployment of clean energy technologies as governor of oil-rich Texas, particularly wind power (Burke & Ferguson 2010). He nominated Governor Christine Todd Whitman of New Jersey- a state that had pioneered carbon mitigation policies throughout the 1990s- to be the cabinet-level Administrator of the Environmental Protection Agency (Rabe 2004). His 2002 target of an 18 percent reduction in carbon intensity, however, was mostly feasible without policy intervention (Metcalf 2008) and the Administration’s most notable move on climate change was the

complete withdrawal from the Kyoto Protocol on March 13, 2001 (Gulliver & Wheeler 2008), less than two months after the inauguration.

Energy efficiency and renewable energy issues had been part of the policy agenda since the oil crises of the 1970s with some notable successful policy outcomes, but there is plenty of opportunity for expansion (Hakes 2008). Rosencrantz and Conklin (2010) note that the United States lost an opportunity to lead on climate change from 2001 to 2009. They report that although President Bush encouraged voluntary programs, improved research and development, tax incentives for renewable energy and cogeneration, various automotive efforts, and carbon sequestration, his White House attacked the science of climate change and strongly supported increased fossil fuels development. Congress also attacked climate change related efforts. The Byrd-Hagel Resolution (S. Res. 98 of the 105th Congress) passed the Senate in 1997 by a 95-0 vote expressing the sense of the legislative body that it would not approve a Kyoto Protocol as the UNFCCC eventually agreed and the final treaty never went for a vote. Bipartisan domestic cap-and-trade legislation, however, such as S. 139 of the 108th Congress with sponsorship from former Democratic Vice Presidential Nominee Joe Lieberman and future Republican Presidential Nominee John McCain, garnered attention if not majority support in the Capitol. EPCA 2005 and EISA, the first comprehensive energy legislation since EPCA 1992, also provided significant regulatory, financial, and information-based support for energy efficiency and renewable energy.

A new President and new Congress in 2009 altered the Federal energy policy environment. President Barack Obama took the Oath of Office on January 20, 2009 and less than a month later signed the largest Federal clean energy bill of all time, the

Recovery Act (Grunwald 2012). ARRA included \$67 billion in tax credit, loan guarantees, and investments for clean energy, energy efficiency, the smart grid and infrastructure, and fuel efficiency and electric vehicles (Geri & McNabb 2011).

Lawrence Summers, the Presidents' chief economic advisor, believed that the stimulus investment was an effective precursor to cap-and-trade legislation for implementation. While that bill never reached the president's desk in his first term, Congress was part of the clean energy discussion for the Recovery Act investment, adding resources and regulations (Grunwald 2012).

With the generalized policy paralysis of the divided Congress (Woodward 2012), the Supreme Court opened further options for executive action without further approval of the legislative branch in 2007. In describing the case in the opinion of the court, Justice John Paul Stevens (2007) wrote:

Calling global warming "the most pressing environmental challenge of our time," a group of States, local governments, and private organizations, alleged in a petition for certiorari that the Environmental Protection Agency (EPA) has abdicated its responsibility under the Clean Air Act to regulate the emissions of four greenhouse gases, including carbon dioxide. Specifically, petitioners asked us to answer two questions concerning the meaning of §202(a)(1) of the Act: whether EPA has the statutory authority to regulate greenhouse gas emissions from new motor vehicles; and if so, whether its stated reasons for refusing to do so are consistent with the statute.

The Supreme Court sided with the pro-regulation plaintiffs opening up the possibility for the EPA to regulate greenhouse gas emissions under the Clean Air Act, giving the executive branch additional authority in this area. This is an option that the Obama Administration exercised on vehicle fuel economy standards in its first term and could open additional regulatory opportunities in the second term (Leonhardt 2013). The lead petitioners in this case included 10 states seeking to encourage federal action.

The public sector, however, did not have a monopoly on climate change action and efforts to improve energy security. Companies including Wal-Mart and General Electric began to address these issues without government intervention, recognizing the challenges and the opportunity to develop the green products and services markets (Claussen, Arroyo, and Semens 2010). The Chicago Climate Exchange (2007) was among the voluntary programs for reducing carbon emissions, creating a cap-and-trade system for businesses and government that could have served as a model for Federal efforts. In addition, corporations across the world invested record capital into the clean technologies sector (Bloomberg New Energy Finance 2012). Financial mismanagement in the private sector, however, also hampered the economy and efforts to combat climate change. Among Enron's accounting crimes that led to the demise of the once-renowned energy company, for example, were to misuse of energy savings performance contracts, harming credibility across the energy services industry for this usually reliable method of achieving energy savings (Rahim 2009). In addition, the global financial crisis, while it led to reduced emissions through reduced economic productivity (see Figure 3 with the sharp decline in 2007), put financial recovery ahead of environmental action on the environmental agenda (Woodward 2012).

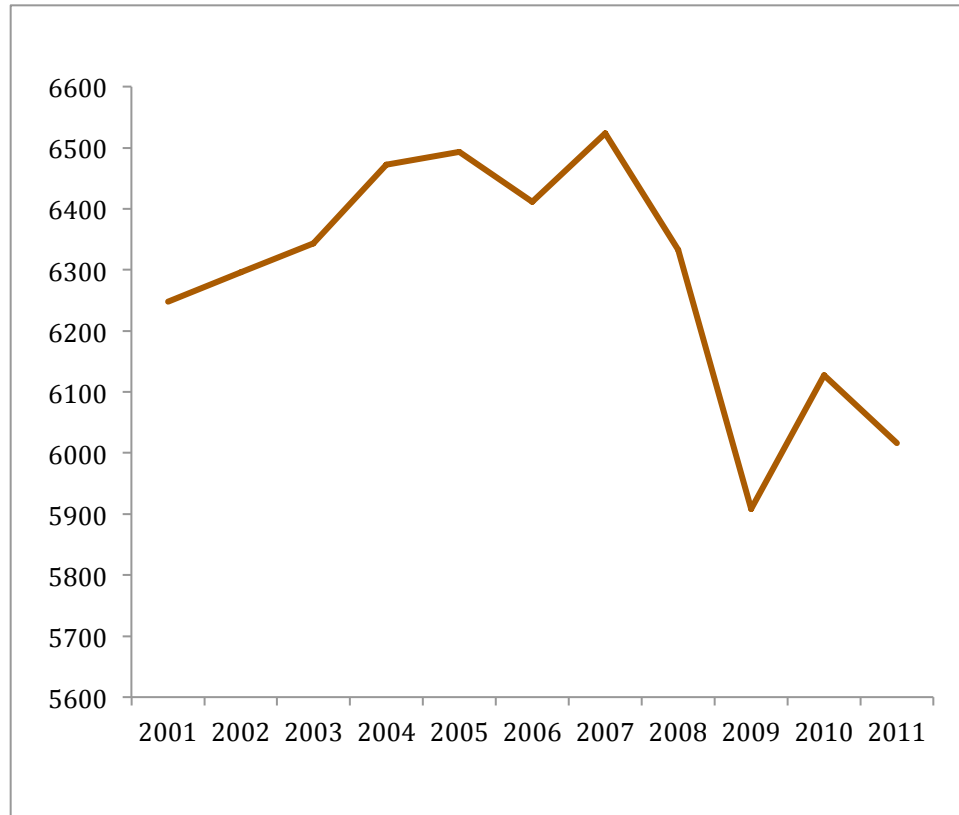


Figure 3. US Carbon Dioxide Emissions in Million Tonnes Carbon Dioxide from 2001 through the Start of the Great Recession (BP 2012)

The global financial crisis, however, also presented an opportunity for a “green” recovery. The United Nations Environment Programme, for example, called for a Global Green New Deal. Babier (2010) reports that the Group of 20 (G20) nations allocated \$454.7 billion towards green stimulus, with South Korea’s Green New Deal equaling a sizeable 3 percent of its total gross domestic product (GDP). The United States devoted 0.7 percent of GDP to green stimulus (12 percent of the \$787 billion Recovery Act), which was average among the G20 countries. This effort, however, was not enough to establish American leadership in clean energy deployment. Figure 4, for example, shows the sizeable lead that Germany, with its progressive feed-in solar tariff, continues to exert over the vastly sunnier United States.

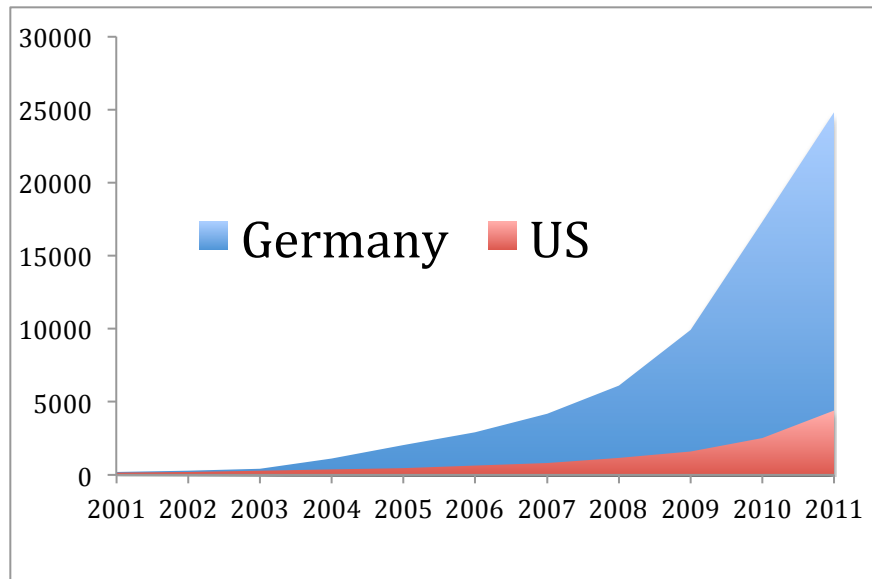


Figure 4. Cumulative Installed Megawatts of Solar Photovoltaic Capacity in Germany and the United States (BP 2012).

The debate over climate change legislation, in fact, became part of the broader dialogue on government intervention into the American economy that continues into the present day. Over two decades ago Raimondo (1992) wrote:

The federal government is suffering from policy paralysis trying to reconcile a reluctance to increase taxes, deficits, and the tension between the Democratic Congress and the Republican Presidency. State and local governments, in turn, are generally collecting taxes and providing education, protecting the environment, caring for AIDS patients, financing affordable housing, and putting police and firefighters on the street.

Mann and Ornstein (2012) describe “confrontational politics and in-your-face” tactics in modern Congresses, with a rise in state-level challenges to federal-level policy prescriptions.

Finding solutions in this policy environment is particularly vexing. With regards to the 1990 Clean Air Act Amendments Henry Waxman (2010), co-author of ACES, reflected generally on Congress, “The greatest misconception about making laws is the assumption that problems have clear solutions, and reaching compromise mostly entails

splitting the difference between partisan extremes.” With a lack of compromise in Washington in the first years of the twenty-first century, state and local lawmaking was an alternative venue for addressing these concerns and voicing political opposition through dissent and policymaking. Before addressing the theoretical framework of competitive federalism, the next section will explore the policy options for addressing the mitigation of carbon dioxide emissions, energy security, and economic development opportunities.

CHAPTER 3

THEORETICAL FRAMEWORK

This research revolves around the academic literature on competitive federalism-both in its traditional fiscal federalism framework and through an expansion of that framework into the ideological realm. It addresses the traditional laboratories of democracy ideas, as well as exploring the states as laboratories of opposition. As this study is testing interdisciplinary public policy hypotheses, the ideas and methods derive from political science, economics, and sociology, as well as the field of public policy. In order to address the assumptions, this literature review will begin with an exploration of energy policies before delving into the underlying theories behind the energy policy related hypotheses outlined earlier.

Policies that can Impact Energy and Sustainability

In his “Crisis of Confidence” speech of July 15, 1979, President Jimmy Carter (1979) outlined policies to reduce dependency on foreign oil and declared to the American people, “Just as the search for solutions to our energy shortages has now led us to a new awareness of our Nation's deeper problems, so our willingness to work for those solutions in energy can strengthen us to attack those deeper problems.” Over the past three decades American policymakers have adopted programs that have increased productivity and decreased the susceptibility of our economy from an energy shock (Alliance Commission on National Energy Efficiency Policy 2013). There are, however, continued opportunities to increase energy efficiency, renewable energy, and decarbonize the economy through regulatory, information and financial policies. This section will establish the key proposals in place and on the agenda that will provide data for empirical tests of the theories.

As the engine of the modern economy, energy and its related externalities impact every actor in society. Gerri and McNabb (2011) summarize the four generalized categories of stakeholders in the energy policy network as energy price movers, energy industry shoppers, energy users and energy regulators. Depending on the policy option and the policy environment, different stakeholders from industry, government, and the public engage the debates over controversial energy issues (Brown & Sovacool 2011).

In addition to multiple stakeholders, energy policies have multiple functions. A survey of 884 energy professionals found a desire for a balanced approach on the goals of energy supply security, environment and climate, and economics and job creation. The study notes that among the general public in polls “Americans can simultaneously have a

preferred policy goal and support policies that may undermine that goal,” (Jordan et al. 2012) indicating the difficulty of climate and energy policy in meeting multiple critical challenges.

With rare exceptions, such as the oil supply disruptions from Hurricane Katrina in 2005 or the Northeast Blackout of 2003, Americans can generally expect that their gas station will have fuel and the lights will go on when they flip the switch. The price of gasoline in the United States can vary based on geopolitical events and the financial situation, but energy is reliable and affordable compared to the developing world or nations with scarcer resources and higher sumptuary taxes. While there are opportunities to protect the energy supply and energy security through the expansion of energy efficiency and renewable energy and energy assurance is a part of SEP, this analysis will focus on the other goals of energy policy rather than the global energy security issues. The expansion of natural gas exploration and energy assurance issues from accidents, natural disasters, and as a result of utility deregulation, however, will serve as a backdrop and control variables in contextualizing the research in a still primarily fossil fuel based economy.

As noted earlier the competition between economic and environmental considerations is one of the most contentious aspects of the climate and energy debate. Daly and Cobb (1989) argue that the economy faces the constraint of the available resources in the biosphere and that market transactions fail to properly account for the externalities of resource consumption and related pollution and wastes. Climate change and energy resource depletion is an example of the tragedy of the commons (Hardin 1968), with a significant challenge in defining the boundaries (Walker & Salt 2006) of

the ecological causes and effects. On a global scale, human society also faces the “limits to growth” that the Club of Rome famously described with exponential expansion meeting limited resource supplies (Meadows et al. 1973). The economy, however, also requires access to affordable energy and, in a world where four of the five largest companies were in the energy business (CNNMoney 2012), the energy industry is critical to profit and employment maintenance or creation.

Energy efficiency and renewable energy can alleviate the environmental concerns with economically viable alternatives to continued fossil fuel resource depletion, but barriers to their deployment are numerous. To simplify the typology of CCCSTI (2009), Brown et al. (2011) identify regulatory, information, and financial barriers to the adoption and deployment of clean energy technologies and recommend policy options for overcoming these challenges in the industrial sector. Geller (2004) identified means to overcome these barriers as: research, development and demonstration, financing, financial incentives, pricing, voluntary agreements, regulations, information dissemination and training, procurement, market reforms, market obligations, capacity building, and planning techniques. Figure 5 shows how states have been proactive and reactive in energy policies since the 1970s.

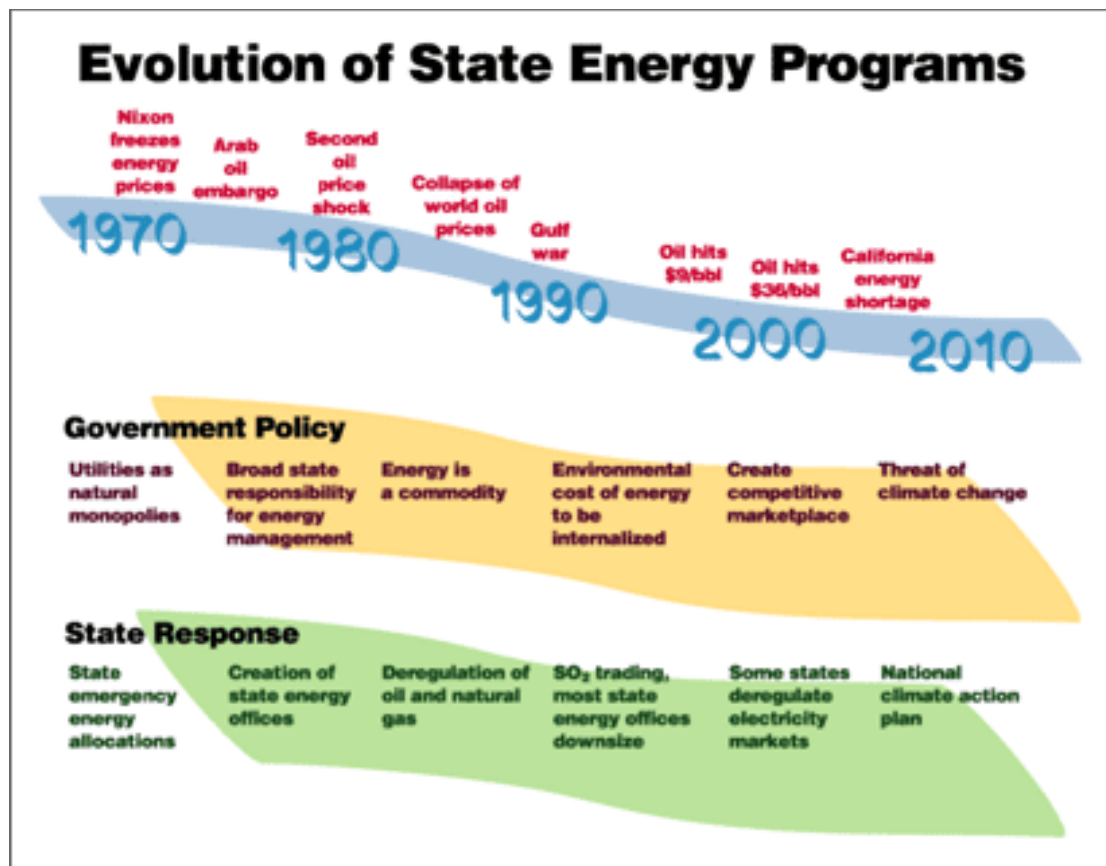


Figure 5- History of State Energy Programs (DOE 2011)

State level energy policies are not well suited towards overcoming all barriers, particularly for policies that are not effectively localized or outside their constitutional authorities. As the focus of the state energy offices for the past decade and into the ARRA period was on overcoming financing and regulatory barriers, these will be two of the focus areas of this analysis. In addition, states took action specifically related to climate change with actions that promoted greenhouse gas mitigation. Finally, there was a strong effort to “green” state government through lead by example initiatives (Richardson 2008) through targeted policies.

Financing, regulatory, mitigation, and lead-by-example policies are not the comprehensive opportunities to impact climate and clean energy. In dividing states on

their policy adoption, Rabe (2008) identified eight policies of focus to separate states based on their levels of policy adoption: Renewable Portfolio Standard, Carbon Tax, Renewable Fuel Standard, Carbon Cap-and-Trade, Statewide Emissions Target, Mandatory Emissions Reporting, Litigation (formal support of Massachusetts in *Massachusetts vs. EPA*) and California Vehicle Emissions Standards. As states have their most exclusive authority over stationary electricity sources (Neresian 2007), vehicle policies (renewable fuel standards and California vehicle standards) will not receive significant attention. The research and analysis will also center on action rather than targets and reporting (including statewide emissions targets and mandatory emissions reporting). Furthermore, as this work relies on gubernatorial impacts, litigation led by state attorneys general is outside of that purview. Within these constraints, however, there are multiple potentially effective policies that states have adopted for consideration.

States have provided significant leadership in the development of innovative tools to overcome the difficulty of obtaining financial upfront resources to finance energy efficiency and renewable energy projects, even where the long-term discounted benefits outweigh the initial costs (Deitchman, Brown, & Wang 2012). Revolving loan funds provide the upfront costs to energy consumers to pay for energy-efficiency retrofits or renewable energy systems and recycle the repayments through energy savings to continue the financing in perpetuity. The National Association of State Energy Officials (NASEO) database shows that states operate over \$925 million in revolving loan funds for all sectors. While some of these programs are new, others have existed since the 1970s. The LoanSTAR program in Texas, for example, has made loans for over two

decades using resources from the petroleum violation escrow (PVE), financing 202 projects, none of which have defaulted (NASEO 2012).

Other traditional sources of clean energy financing are public benefits funds and direct tax incentives or rebates (Carley 2011). The Center for Climate and Energy Solutions (C2ES 2013) notes that public benefits funds, also known as systems benefits funds, “are collected either through a small charge on the bill of every electric customer or through specified contributions from utilities.” As with tax deductions or direct financing appropriations, these resources can help for the procurement of energy efficiency or renewable energy systems (as well as research, development, and demonstration projects).

States have also developed a variety of innovative financing tools in recent years. They have worked with utilities on on-bill financing efforts, where customers can pay for clean energy upgrades over time on their regular electricity or natural gas bill. In addition, they have worked with lending institutions to buy down loan rates through loan loss reserves (Deitchman, Brown, & Wang 2012). The most prominent effort, however, has been in the authorization of policy assessed clean energy (PACE) financing activities (Fuller et al. 2009). Tax lien financing through PACE taxation districts allows property owners to finance energy-related upgrades through debt assessed to real estate. This debt is repaid through the property taxes collected by municipal governments. PACE financing operates through municipal bond sales, the proceeds of which go to finance energy upgrades. PACE programs have faced federalism-related regulatory challenges due to concerns of Fannie Mae and Freddie Mac about the seniority of loan repayments, but serve as an important indicator of state interest in overcoming financing barriers.

In the regulatory arena, states have been active in creating incentives and penalties to encourage clean energy and conservation. Although results are still mixed as the policies are on-going, a renewable portfolio standard (RPS) commits utilities in a state to achieve a percentage of electricity sales through specified renewable resources (Matisoff 2008, Chandler 2009, Carley 2011). States tailor these policies to their specific natural and technological resources, resource trading opportunities, and time frame (for example, a certain percentage by a date with a carve out for solar or wind or another technology), with additional states having non-binding targets. In a similar vein (and sometime as part of the same legislation) an energy efficiency resource standards (EERS) commits a state to meet a percentage of its forthcoming demand through reductions from business as usual consumption (Carley 2011, Foster et al. 2012). While EERS policies are generally newer and less common than RPS policies, both represent a regulatory mechanism for clean energy deployment.

In an intrastate setting, improving the design and efficiency of buildings through the most up-to-date advanced building codes can have a significant impact on electricity savings and emissions reductions. States, often in conjunction with local governments, have jurisdiction over requirement for technologies that improve the building shell and equipment energy consumption. While national organizations design the standards for code development, it is up to state and local governments to adopt and implement building energy codes for residential and commercial structures (Sun et al. 2012, Nelson 2012, Foster et al. 2012).

The regulatory environment can also create incentives for wasteful business practices or encourage companies to oppose opportunities for improved technologies

(Brown & Chandler 2008). For example, electricity and natural gas suppliers earn profits through the regulated sale of metered power to homes and businesses, thus disincentivizing them from encouraging practices that would lead to usage reduction through efficiency or conservation. Decoupling sales from revenue or similar regulatory mechanisms is a best practice mechanism to ensure a positive return on investments in generation and efficiency that overcomes this barrier of common utility rate designs in traditional and restructured market (Eto, Stoft, & Belden 1997; Kushler, York, & Witte 2006; Sullivan, Wang, & Bennett 2011). While the focus of the Recovery Act State Energy Program was on stimulus through funding of clean energy project, commitments on both decoupling and advancements in building codes were part of the requirement for states receiving the money through governors' assurances and a required part of the state planning process.

In addition to financing and regulations for clean energy deployment, states have specifically tackled climate change through greenhouse gas emissions reductions. A first step is for states to draft and issue a climate action plan to assess the options to address this policy problem. This also serves to recognize and acknowledge the issue and creates opportunities for administrative and legislative action. These plans vary by state but include clean energy measures, as well as adaptive programs to climate change impacts (Krause 2010; EPA 2013). Drummond's (2010) statistical analysis from a city and regional planning perspective shows that adoption of a climate action plans has a small but significant causal impact on declining greenhouse gas emissions.

Jurisdictions can go a step further than creating a plan and put a price a carbon dioxide. Price signals are key to changing behavior; as Metwon and Cacho (2011)

determine through an empirical study, “While demand for Green Power may be influenced by sociological factors such as conformity and ‘ethical’ behaviour [...], this study shows that Green Power sales are responsive to price.” Pigouvian taxes or auctions can raise prices on an externality-laden transaction- such as burning fossil fuels for energy (Daly & Cobb 1989). Thus, a carbon tax, which stabilizes prices, or a cap and trade system, which stabilizes emissions, can modify behavior and correct for non-market damages (Stavins 2000; Tietenberg 2005; Keohane, Revesz & Stavins 2005). Funtowicz and Ravetz (2003), however, caution:

Even when pricing rather than control is used for the implementation of economic policies, the prices must be set consciously, by some agency; and this is then a highly visible controlling hand. When externalities are uncertain and irreversible, then it is impossible to set ‘ecologically correct prices’ (through contingent valuation or other economic techniques) to be utilized in actual or fictitious markets.

With the success of the cap-and-trade market for sulfur dioxide to reduce acid rain from power plant emissions in the United States under the Clean Air Act Amendments of 1990, policy makers in Europe and Australia and through various private sector initiatives have extended this market-based mechanism to greenhouse gases (Waxman 2010; Sandor 2012). This has also occurred in multiple American cities and states.

With the failure of the United States to ratify the Kyoto Protocol the major story of climate change policy from 2001 to 2012, the state-level climate plans and the creation of cap-and-trade systems in states and regions are a major factor in assigning the state governments this leadership role (Resnik, Civin, & Frueh 2008; Rabe 2008; Lutsey & Sperling 2008; EPA 2013; C2ES 2013). The Regional Greenhouse Gas Initiative (RGGI) is a collaboration of nine Northeastern and Mid-Atlantic states to place a behavior-

adjusting price on carbon dioxide emissions through a cap-and-trade system in the utility sector. It is the first multi-state economic mechanism for pricing greenhouse gas emissions to encourage mitigation (RGGI 2013). While the Midwest and West also considered a similar program, the only other state to have currently established cap-and-trade is California through its Assembly Bill 32.

While New Jersey once led the way on climate change in the 1990s (Derthick 2010), scholars and practitioners alike point to California as a current world leader in this policy subsystem, with its policies establishing an economy-wide cap on carbon, efforts to curb tailpipe emissions, mandates on renewable energy technologies, decoupling of electricity prices from utility sales (to incentive energy efficiency), and energy performance standards. California is in this position because of public opinion, potential to suffer from adverse climate impacts, its political environment, and because these policies are good for the internal state economy (Rabe 2009). In signing a climate change pact with California to “commit to urgent action to reduce greenhouse gas emissions and promote low carbon technologies” in the summer of 2006, British diplomats emphasized the leadership of Sacramento and noted that their goal was not to negotiate around the Federal government, even after talks between Prime Minister Blair and then President George W. Bush failed at the Group of Eight (G8) Summit earlier in 2006 (BBC 2006). That said, the United Kingdom and other countries began to look to California after the Federal government indicated it would not take action in this area under the political leadership in the White House and Congress of that time (Hollis 2010). Despite the prominence of California, it is certainly not the only state providing leadership. The United Kingdom, in fact, also signed climate pacts with Florida, Wisconsin, and

Michigan, in addition to other Foreign-State Agreements (FSAs) across the globe on this issue (Selin & VanDeveer 2010).

In becoming leaders, California and other states have started by getting their own "houses" in order. Energy Savings Performance Contracting agreements are particularly popular in the municipal, university, school, and hospital (MUSH) market. Under an ESPC the building owner contracts with an Energy Service Company (ESCO) for 10 to 20 years and can repay the initial costs as the savings accrue (Zobler and Hatcher, 2003). These contracts have not been particularly popular in the private and non-profit sectors because of financial regulations and ESCOs' preference for large projects under ESPCs. ESPCs, however, often include guaranteed savings from the ESCO and have been in place, with success, for over three decades (Katz et al., 2011). The Kansas Facility Conservation Improvement Program, for example, has made over \$130 million in energy-efficient improvements in state facilities through ESPCs, saving \$11 million per year in energy expenditures while reducing the state's carbon footprint (NASEO, 2008). An expansive ESPC program is an indicator of a state's commitment to leading by example.

Leading by example in government on climate change has been part of the rhetoric of politicians through this century (Richardson 2008). It has also resulted in rules and procurement practices that save energy and encourage renewable energy development (EPA 2013). For example, many state and local governments have adopted the Leadership in Energy and Environmental Design (LEED) standards of the United States Green Building Council (USGBC) to reduce consumption and the ecological footprint of government buildings (Koski 2010; Koski & Lee 2012). These efforts, along with other green government standards, are making the governmental entities themselves-

often one of the largest local consumers of energy- into leaders and models in their own communities for citizens and the private sector.

Table 1 summarizes the key policies justified above for specific consideration under the theoretical framework in understanding why states became leaders in these areas. As a point of comparison, despite proposals the Federal government currently does not have a renewable portfolio standard, energy efficiency resource standard, cap-and-trade program, or climate action plan that made it through the legislative process. In addition, where the Federal government does have authority, it has often followed state leads on rebates and tax incentives, EPSC programs, and green government standards (Doris, Cochran, & Vorum 2009; DSIRE 2012, C2ES 2013). It's relationship with the states on building codes, decoupling, and PACE financing will require further investigation and contextualization through the lens of theories of competitive federalism.

Table 1- Policies by Type, Market Impact and State-Level Jurisdiction

Policy	Market Impacts	State-Level Jurisdiction
Financing Mechanisms		
Public Benefits Fund	Energy Efficiency and/or Renewable Energy	Legislative/Executive and/or Public Utility Commission
Revolving Loan Fund	Energy Efficiency and/or Renewable Energy	Legislative/Executive
PACE Financing Enabled	Energy Efficiency, Possibly with Renewable Energy	Legislative/Executive
Tax Incentives/Rebates	Energy Efficiency and/or Renewable Energy	Legislative/Executive
Regulations		
Renewable Portfolio Standard	Renewable Energy	Legislative/Executive and/or Public Utility Commission

Table 1 Continued

Energy Efficient Resource Standard	Energy Efficiency	Legislative/Executive and/or Public Utility Commission
Advanced Building Codes	Energy Efficiency	Legislative/Executive and/or Relevant State Board (ARRA Assurance)
Decoupling	Energy Efficiency	Legislative/Executive and/or Public Utility Commission (ARRA Assurance)
Climate Action Activities		
Climate Action Plan	Strategic Planning and Correcting Externalities	Legislative/Executive
Cap and Trade Program	Correcting Externalities	Legislative/Executive (With Possible Regional Alignments)
Lead-by-Example Programs		
ESPC	Public Sector Energy Efficiency, Possibly with Renewable Energy	Legislative/Executive and/or Executive Agency
Green Government Standards	Public Sector Energy Efficiency and/or Renewable Energy	Legislative/Executive and/or Executive Agency

Table 1 defines the target market of Financing Mechanisms, Regulations, Climate Action Activities, and Lead-by-Example Program by impact area addressed and jurisdiction within state government. Every state government has a different constitutional structure and this impacts the making of energy policy decisions. With the focus of this research on governors, it will be important to understand their institutional role in policy making, particularly where authority may be ceded to the public utility commission or another state agency. This is not a comprehensive list of actions, but it is a summary of the most important steps states can take to lead in climate and clean

energy. Furthermore, these policies are synergistic. In discussing financing options for energy efficiency retrofits before the United State Senate Committee on Energy and Natural Resources, William A. Rodgers (2013) of GoodCents Holdings, Inc. testified:

In our experience, the most successful programs are those in which States establish energy efficiency resource standards and then allow the marketplace to develop the best methods to achieve those goals. The collaboration comes through a strong alignment of interests of the State, regulators, utilities, commercial and industrial businesses, and the residents, along with the private sector service provision.

The next section will delve into the theoretical framework of policy entrepreneurship, policy diffusion, the policy process, and competitive federalism that drove these individual and synergistic policies in the states in the public policy environment for further indexing and empirical analysis.

The Theory of Competitive Federalism

Pushing for federalist cooperation, President-Elect Barack Obama spoke before the National Governors Association in December 2008, “That’s the spirit that I want to reclaim for the country as a whole. One where states are testing ideas, where Washington is investing in what works, and where you and I are working together in partnership on behalf of the great citizens of this nation” (Quoted in Dinan & Gamkhar 2009). On the other hand, in a report for the National Governors Association from the National Academy of Public Administration Panel on Federal Preemption, John, Stenberg and Wise (2006) warn, “During the twenty-first century, these centralizing forces are likely to exert increased pressure for preempting state and local responsibilities. Yet state and local governments exercise important responsibilities and play vital roles in achieving national policy and program goals.” It is these opportunities for cooperation, experimentation, and institutional tensions and rivalries that give rise to competitive federalism and the resultant policies. Competitive federalism is the functional and legislative conflict between units of government horizontally and vertically in the system of governance, and is advanced here as a force for why states led on climate and clean energy policy from 2001 to 2012.

Article I, Section 8, Clause 3 of the Constitution- the Commerce Clause- legalizes, “[The Congress shall have Power] To regulate Commerce with foreign Nations, and among the several States, and with the Indian tribes,” while the Tenth Amendment states, “The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.” It is this gray, overlapping, and contentious area between the states and Federal authorities that is at the

heart of competitive federalism. In his tome on the topic, Wildavsky (1998) disputes the conventional wisdom and simplifying assumption that, “political regimes are either centralized and hierarchical or non-centralized and competitive.” The system is not orderly like a layer cake with clear delineations of roles, or even a swirled set of role like a marble cake, a disorderly set of authorities like a fruitcake, but rather birthday cake with “sweeteners” at every level. He argues that, “money trumps interdependence,” but that “Existing arrangements are politically rational not because they are perfect or cannot be improved, but because they accurately reflect the nature of political preferences in this country” (Wildavsky 1998). The fiscal fights- both vertically and horizontally- are central to competitive federalism.

As stated earlier, Shannon and Kee (1989) see competitive federalism as arising at the end of the 1970s through budgetary analysis due to declines in federal social spending. In more recent years, Dinan and Gamkhar (2009) observe that the economic downturn and resource distribution had impacts on vertical federalism politics, as Republican governors supported ARRA while Republican members of Congress opposed federal stimulus to the states. Unfunded mandates are particularly vexing to states in their current precarious financial positions. Horizontally, Breton (1991) notes the game-theoretic framework in setting state fiscal policies, something that will be especially relevant in the discussion of diffusion. As Kincaid (1991) states, the inter-jurisdictional competition fits neatly into market theory, but he also argues that it need not derail collaboration. Both Breton (1991) and Kincaid (1991), however, note the importance of Federal arbitration where states are in dispute, with Liner (1989) describing the

importance of compensating between states with different levels of economic opportunity.

Beyond the fiscal federalism and into regulatory federalism there are also competitive considerations. Dinan and Gamkhar (2009) note that squabbles over the regulation of the healthcare industry- particularly related to the Affordable Care Act (“Obamacare”)- and immigration- particularly related to Arizona’s intensive document requirements in response to that state’s observation of a lack of federal enforcement- as well as energy standards and permitting, have expanded state discretion in federal matters. On the other hand, federal preemption can threaten state innovation. John, Stenberg and Wise (2006) posit that the federal government can provide uniformity through federally mandated standards, federal minimum standards, grant conditions, cooperative standards, and external standards and can avoid full preemption through partial preemption, Federal-state performance partnerships, uniform state laws, interstate compacts and federal incentives to encourage consistent state action. All of these methods that can protect tailoring and consistency while ensuring necessary uniformities are part of federalism in clean energy and climate policy in the United States.

Zimmerman (2007) details specific examples of Congressional preemption during the first term of the George W. Bush presidency. Among the acts discussed in this broad article is the Energy Policy Act of 2005. After looking into the record during these four years, he concludes by framing the coercive or cooperative nature of this policymaking enterprise through the fame of “kaleidoscope federalism” with the complexity of the asymmetrical relationship between states and the federal government. As Derthick

(2010) theorizes, one-size fits all governance does not suit many of the issues that are subject to federal preemption.

A specific area of competitive federalism action during the Bush era related to stem cell research. Mintrom (2008) begins his analysis of the issue at hand with a summary of the field:

Among scholars of United States federalism, it is generally agreed that the period from 2001 through 2008 has witnessed an increased in tensions between the national and state governments. Much of the blame for those tensions has been placed on the conservative policy preferences associated with the presidency of George W. Bush and the degree of control the national government has sought to gain over policy implementation [...].

With regards to stem cells, the Bush Administration implemented policies and eliminated funding limiting research with embryonic stem cells due to beliefs about the destruction of embryos. On the other hand, several states sought the opportunity to support these biomedical science opportunities. Through a statistical analysis of the states, Mintrom finds:

Support for funding of embryonic stem cell research has been most common in states where the citizenry is more liberal in political ideology and where the Democratic Party has controlled both house of the state legislature. Support from governors, no matter their party affiliations, appears to have been important in securing funding for embryonic stem cell research. Bipartisanship between state legislatures and governors has been common in the cases where funding has been approved. Support for funding of embryonic stem cell research has also been most common in states where there has already existed relevant scientific capacity.

In an non-empirical law review article, Bulmen-Polzen (2014) writes of challenges on stem cells, Obamacare and other controversial issues of the present day:

A key, yet largely neglected, reason for these state challenges is partisanship. Put in only slightly caricatured terms, Republican-led states challenge the federal government when it is controlled by Democrats, while Democratic-led states challenge the federal government when it is controlled by Republicans.

This research will show that the partisan political climate of Washington has spread into the competitive federalist institutions responsible for approaching the issue of climate change.

There are clear similarities of experience for stem cell research in Mintrom's (2008) paper and the climate and clean energy situation in the states. The federal government took a back seat on both issues. There were scientific controversies. Governors saw an opportunity to lead and compete where there were the social, political, and economic resources to expand knowledge and capacity in an area. Mintrom's (2008) simple but significant statistical modeling will provide a useful analogue in this analysis.

The most notable federalist challenge during the next administration came when states sued the federal government over requirements of healthcare reform, with the Supreme Court upholding the act. Beyond direct preemption, however, much of the competitive federalism arose in the wake to responses to the financial crisis. The Race to the Top Program pushed a new education agenda on the states in reforming their kindergarten through twelfth grade schooling. As a successor to No Child Left Behind it was not new for presidents to push education reform and standardization across the country, but Race to the Top's dynamics of specific measures and financial incentives is a new model for cooperation and coercion that the administration has been seeking to replicate in other public policy areas- including a proposal on clean energy in the President's Fiscal Year 2014 budget that he sent to Congress.

States needed to actively pursue competitive Race to the Top grants through alignment of regulations related to standardized testing data and other potentially controversial reforms. Nicholson-Crotty and Staley (2012) tested the timing and contents

of these applications through a competitive federalism framework. The analysis looked into the willingness to accept the coercion and credit for the federal government and the factors that contributed to this decision. Among the independent variables under consideration were credit claiming, political party of the governor, governor tenure, and the current status of education achievement and education factors in the state. Nicholson-Crotty and Staley (2012) conclude from their statistical modeling of the timing and quality- as measured by the Department of Education reviewers' scoring of the grant applications- that, "federalism relationships may be influenced more by electoral ambitions of state politicians than by their state's ability to actually produce public goods."

This is where scholars must consider the two rationales of competitive federalism. Functional federalism refers to the actual provision of public goods and services and the relevant regulation, finding the optimal level for adoption and implementation of public policies. Legislative federalism refers to the politics of federalism, the intrastate and federal-state relationships on achieving higher office (Peterson 1995). Nicholson-Crotty and Theobald (2011) discuss the importance of "claiming credit" in areas of governance with joint authorities, using transportation for the case study. Roeder (1994) refers to the "dual electorate" of voters and the abdication of federal powers to states in public policymaking. As with Nicholson-Crotty and Staley (2012), this study will analyze both the functional and the legislative. Through the first hypothesis, the political motivations of governors and their ambitions will come under a microscope. The second hypothesis will allow the research to recognize functional perspectives of competition amongst early enactors and laggards in climate and clean energy policy. While it is possible to separate

the functional and legislative both perspectives are a part of the policy process as politics, economics, and society become intertwined in the adoption of climate and clean energy policies.

The other major dichotomous definitional element of competitive federalism is the vertical and horizontal division. Vertical competition is between the states and the federal government. Horizontal competition is among the fifty states. Both directions of competition within the systems of governance- functionally and legislative- are integral parts of understanding the competitive federalist dynamics.

Vertical federalism is where arguments of top-down versus bottom-up enter the scholarly and practical discourse. Schwab (2006) asks in exploring the Clean Air and Clean Water acts, which set up federalist systems similar to other policy issues, “Should we move toward greater centralization, thus giving more responsibility to the federal government? Or should we encourage further decentralization and allow state and local governments a greater voice in environmental policy?” Every level of government has a role and responsibility related to the environmental and economic concerns of their constituents, particularly in a federalist system. The neoclassical economic theory of environmental policy and regulation, however, does not provide a universal answer on centralization versus decentralization (Baumol & Oates 1988). There also are advantages and disadvantages with regards to technological advancement related to centralization (Taylor 2007); technology being a potential driver of carbon reductions. As North (1990) notes, technology can move the bounds and change the impacts of production and consumption.

Polycentrism is an approach to get the benefits of centralization and decentralization. Andersson and Ostrom (2008) discuss polycentricity as “the relationships among multiple authorities with overlapping jurisdictions.” They argue against decentralization as the sole answer to common pool resource issues, such as climate challenges, and state, “Many policy reforms attempt to streamline government organizations- a strategy that often make the resulting governance structure less able to deal with complexity of resource problems.” Norton (1996) says, “Environmental problems are basically problems of scale,” and Costanza et al. (1998) urged scalar considerations in making sure that sustainability policies match the scale of the problem. A problem as wicked as climate change, with its implications from local to global, requires flexible actions at multiple scales.

Brown and Sovacool (2011) build a case for a polycentric approach to climate change and global energy security through case studies and other analysis. They argue that polycentrism can provide dialogue, redundancy, accountability and economies of scale. Sovacool (2011) declares that, “Under a system of polycentrism, if one level of government, industry, or civil society fails or defaults on a problem, other layers remain available to address the task.” In addressing a global commons problem with local, national, and international applications and implications, a multi-level system of governance needs to fit the tasks at hand. Even in this effort to attain polycentricity, there will remain consistent tension among the various centers as they argue the functional merits and politically prudent legislative responses of their roles.

One challenge for governors involved in vertical competition is achieving credit for innovations and accomplishments in the federal system (Nicholson-Crotty &

Theobald 2011). As an example, the debate over the stimulus bill in 2009 revealed tensions between federal and state elected officials, particularly from the Democratic Congress and Republican governors (Grunwald 2012). State and local governments chose climate and energy as an area of opportunity for legislation, litigation, and action in part due to a lack of federal policy adoption (Engel 2009). Rabe (2008) notes that most analysis of American climate policy focuses on the failure of the Senate to ratify the Kyoto Protocol and the lack of significant proposals to reduce greenhouse gas emissions from the Administration of George W. Bush. The contemporary wisdom focusing on the United States' climate policy exclusively at the federal level misses significance of the "bottom-up" efforts of the states, with the leadership of almost every state passing or at least proposing significant actions. Posner (2010) argues that states can "spark" federal action. The review of state-level leadership with focus on how the states have pushed the governing paradigm for controversial proposals, meeting resistance but also creating important models of innovation that have bled into federal proposals on climate and clean energy (Bell 2002; Peterson & Rose 2006; Byrne et al. 2007).

There is concern, however, that too much federal intervention could, in fact, hamper state and local energy and environmental programs. In a law review article, Rose (2008) delves into the implications of a policy shift at the top of the federalist structure, which could be beneficial, detrimental, or mixed towards the capabilities and capacity of sub-national actors. The national level government, however, also provides important financial support to state and local energy and environmental programs. In addition, qualitative research indicates that the diversity and incongruence of state and local policies can have a negative impact on the deployment of low carbon technologies

(Brown & Chandler 2008). For example, while state energy appliance standards have yielded significant benefits, it is a challenge for firms in the market when the companies have to meet multiple standards (Carlson 2008).

There are models of vertical integration in the international setting that can provide insight within the United States. Rabe (2007) argues that the success of ozone destroying gas mitigation relied on a regime that was hierarchical but flexible. In addressing European and American collaboration on climate, setting floor and not ceilings, combining policy flexibility with enforcement, burden-sharing, and redistribution have lead to positive policy outcomes (Selin & VanDeVeer 2010). Functionally within the United States, Peterson (1995) notes that the costs of federalism are regional inequities and inefficiency, but that the proper role of the federal government is redistribution while the proper goal of the states is economic development. Cooperation and coercion are part of this game (Wildavsky 1998). The balance of standardization and consistency with tailoring and experimentation are a further confounding factor in addressing these wicked problems.

Horizontal competition also has potential drawbacks towards effective policymaking. The prisoners' dilemma, a key theoretical concept in a rational choice approach to comparative politics (Levi 2009), is a major research consideration when analyzing state-level and national-level decisions in energy and environmental matters. Revesz (1992), in an often-cited law review article, argues that the race-to-the-bottom was a form of the prisoner's dilemma in its mechanisms for strategic interaction that lead to suboptimal outcomes in economic, as well as environmental, issues for the society. Although his argument is lucid, Revesz does not consider that a prisoner's dilemma

economic game generally relies on an assumption of non-communication between the players in leading towards a poor result for each individual, firm, or state and the society as a whole. In environmental regulation, states can and do communicate. Federal intervention, however, does place limitations on the game that, at its best, forces the players to cooperate for the greater good of the economy and environment of the United States, but can also serve as an impediment to innovation in state and local governments.

The “race to the bottom” is not exclusively related to energy and the environment and also impacts direct budgetary situations. Using an event history model of welfare benefit increases or decreases, however, Volden (2002) finds that a race to the bottom for this social spending is not a simplistic effort to avoid becoming “welfare magnets.” In fact, the analysis shows that states are more prone to raising their benefits in response to neighboring states doing the same, which is consistent with theories on regional diffusion (Berry & Berry 1990; 2007). Despite these results, there are clear costs to states undercutting one another with tax breaks and other incentives that shift jobs rather than create new employment opportunities (Story 2012). It is a legitimate question as to whether the costs of competitive federalism outweigh the benefits, but a healthy entrepreneurial spirit among the states can drive innovation and fits in to capitalistic governance paradigms.

Working under and with the federal government since the 1970s has had a variety of impacts on the states. Magazine (1977) posited that the intergovernmental structure had an adverse impact on local activities. He said that roles were unclear and led to disagreement between politicians and officials. Rosenbaum (1998) reports that in the 1980s, state and local environmental program suffered due to strong federal mandates,

but limited resources from federal grants or other intergovernmental expenditures to meet the challenges of these expanding roles. Rinquist (1997) says state politics in this subsystem are “neglected” and that President Ronald Regan’s “New Federalism” had a negative impact on policy outcomes in this area. For all of these challenges and limitations, however, there have also been significant benefits to federalism in climate and energy.

Rosenbaum (1998) argues that federalism helps to meet location-specific challenges and bring voice, diversity, and experimentation to environmental programs. He uses the case of acid rain mitigation, in which governors from the Northeast pressured the Ohio Valley states to practice more stringent pollution abatement, as a success. Rosenbaum notes that new global challenges and the internationalization of environmental issues, particularly climate change and associated policies and agreements, have changed the nature of the local, state, federal, and international relationships in this field.

From Tiebout’s (1956) classic work on citizens “voting with their feet” to Buchanan’s (1995) work on competitive federalism as the “ideal political order,” states competing- and collaborating- is a value in American political culture. Not all of the experiments in Brandeis’s (1932) laboratories of democracy- or the modern laboratories of opposition- succeed. The failure of California’s electric utility restructuring, for example, provided the model of how states ought not to proceed on issue (Harrington, Palmer, & Walls 2006). Successes, however, have brought new models of innovation that enhance state policy and can impact the nation as a whole despite commons challenges with the interstate impacts of locally-implemented- or the lack of locally

implemented- programs. This analysis will show that having these 50 governments can foster functionally effective solutions to challenging global problems problems. To understand the legislative perspective, the key is to understand the lead politician in the state- the governor- and the institutions and opportunities of his or her power. There are challenges to inter-jurisdictional competition, but the innovation and experimentation in this federalist policy environment was fundamental to state leadership in climate and clean policy.

The Role of Governors and State Institutions

The first hypothesis under the competitive framework is that a national, bipartisan network of ambitious, entrepreneurial governors drove climate and clean energy policy innovation from 2001 to 2012. The power of the executive in a state is vested in the governor. While there are multiple roles for this leader, the tasks of chief of state, legislative agenda setting, chief of party, and leader of public opinion (outlined in Harrigan 1998) are relevant to policy adoption in the legislative competitive federalist environment. Governors also collaborate and influence federal policy, with three of the last five presidents rising to the highest office in the land after serving as a governor. While their roles vary, Ronsone (1982) simplified the ever-evolving position as, “the governor ‘wears three hats:’ he [or she] acts as party chief, legislative leader, and the state’s chief administrator.”

Focusing on the governor is a simplifying assumption for this study. Legislatures are critical to policy adoption, but it is the governor who is at the top and is the most visible official in the political hierarchy. Within the executive branch there are a variety of officials involved in energy decisions. State energy offices (SEOs) occupy different positions within the internal governance structure, as outlined in Figure 6 from a survey report of the National Association of State Energy Officials (NASEO 2009). The report also notes that different functions are often spread throughout government. For example, in some states housing departments manage low-income weatherization programs and administration departments may run lead-by-example activities. The empirical analysis will explore relationships between governors and the public utility commissions and other appointed or elected boards such as those that set energy codes. For instance, in

New York the public service commission established the public benefits fund, which is atypical as most states with this policy passed it through the legislature. The fact that this work centers on governors is a limitation, but also will provide targeted insight into these key policymaking actors internally and externally to their respective states.

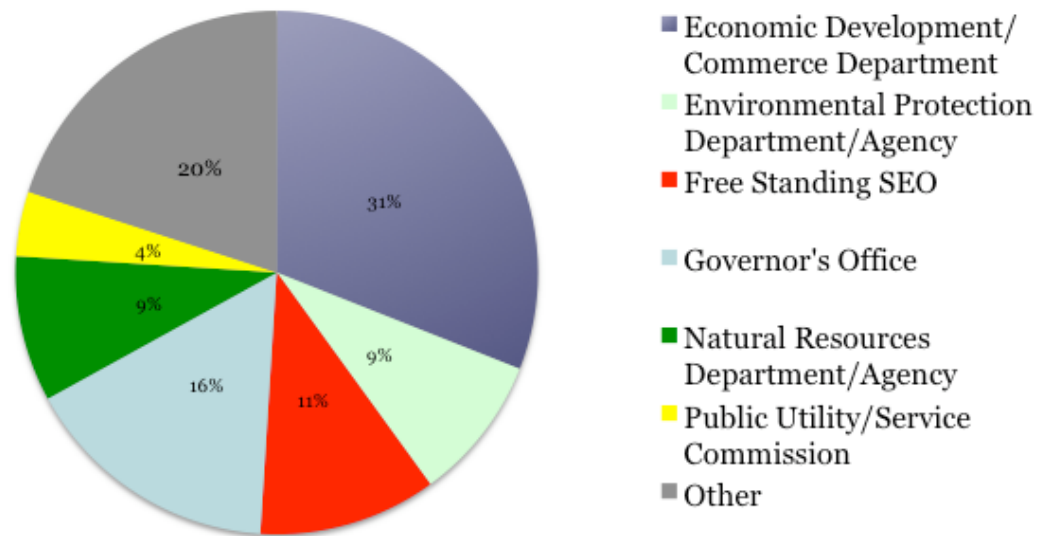


Figure 6- Administrative Location of State Energy Offices from NASEO (2009) Survey Data

The authorities of governors within state institutions differ by state. Typical indices of power for governors vary based on their allowed tenure, separately elected executive branch officials, and formal powers including appointments, budgets, and veto authority (Morehouse and Jewell 2004). Beyle's (2007) scoring of Governor's Institution Power was used in this empirical analysis for controlling for the formal abilities of the governor to lead on public policy, but did not lead to significant conclusions. This does not, however, account for the informal influence of the governor. While Barrilleaux and Berkman's (2003) study show the predictive power of institutional characteristics with political, economic, spatial, and temporal control variables, informal factors require

consideration in looking at the 131 governors who served at the beginning of a calendar year from 2001 to 2012.

Each governor arrived in office with his or her own policy goals and political ambitions. In his famous case study of governance, Dahl's (1961) scholarship adds the role of the politician for developing understanding of leadership. Gubernatorial style is an area ripe for scholarly analysis (1982). Ferguson & Barth (2002) study gubernatorial personality in the legislative arena and find that motivation for power and achievement- measured through statements in inaugural addresses- drive leadership in working with the state legislature. They conclude, "recognition that the personality of individual governors [...] significantly affects policymaking provides an important insight into American politics more generally. That is, any attempt to explain executive/legislative outcomes is underspecified absent such personality variables." Institutional factors of the legislature, political factors, and even timing within the term and other factors outside the control of the individuals in the executive branch lead to success or failure on moving an agenda (Ferguson 2003).

Influence and agenda setting are key to executive influence on the legislative process. Governors deal with perennial issues such as education, cyclical issues such as environmental matters, and transitory issues such as the death penalty. From his analysis of these issues in state of the state addresses, Herzik (1991) reveals, "At times the governor must serve as the catalyst, translating inchoate public needs and demands into workable policies. In other circumstances, governors must work to educate both the public and fellow state leaders as to true state needs and interests." In short, governors

need to exhibit the vision, competency, and demeanor to achieve success in policy adoption within their states.

The political path of the governor plays an important role in their functional and legislative methods and goals. The campaigns, endorsements, primaries, debates, and general elections set the course of gubernatorial governance. Once in office, 80 percent of governors who run for reelection win (Morehouse and Jewell 2004). Facts endogenous and exogenous to the leadership in the governors' mansions impact their electoral and policymaking outcomes. For many governors, this is their highest office they will ever hold. There are, however, governors who look at themselves in the mirror and see a future federal executive, following in the footsteps of some predecessors.

“Ambition lies at the heart of politics,” writes Schlesinger (1966), particularly in the transitory office of the governor. He frames his work on data of American political careers, “Ambition theory focuses on the ways in which men cooperate- form organizations, coalitions, or factions- to serve their political ends. [...] At the same time ambition theory can be brought to bear on overt acts such as the votes of a legislator or policy proposals of a governor.” It is difficult to measure ambition, but “professional” politicians are often clear in their purposes and motives in their own self-interest.

This analysis makes the assumption that credit-claiming ambitious politicians chose an area of political opportunity in competitive federalism (Nicholson-Crotty & Theobald 2011; Schlesinger 1966). With a lack of federal intervention, some of those who sought national leadership positions in the future, including several men who ran for President in 2012, may have chosen to publicize policy in climate and clean energy. As it is impossible to understand every motivation, the operationalization of “ambitious

governors” will be those who went on to seek the Presidency or Vice Presidency, chair a major governors association, or achieve a federal cabinet-level appointment. While this is not a perfect measure, it shows a revealed preference for seeking higher office.

In addition to ambition, the first hypothesis also considers party, which can feed into ambition. The dynamics of political parties within states and their functions in the policy process are highly variable (Ronsone Jr. 1982; Munchmore & Beyle 1983; Morehouse & Jewell 2004). Party, however, becomes particularly relevant when multiple governors meet on the regional or national stage. Adam and Kriesi (2007) note that an understanding of policy networks can serve as an “analytical toolbox” in studying relationships among policy actors and the role of these relationships in theories of the policy process. Posner (2009) states that networks “become a valued and essential adjunct and tool of governance in environmental governance.” President Theodore Roosevelt founded the Governor’s Conference in 1908 and it grew in stature as the roles and responsibilities of governors expanded throughout the first half of the twentieth century (Brooks 1961). Today, governors have both a strong presence in Washington, including offices in the Hall of States across from the Capitol, as well as regular coordination with one another (Beyle & Munchmore, 1983). Party and ideology are critical independent variables for policymaking.

Within their states and in their professional networks, governors are key in the agenda setting process. In the annual State of the State speech, the governor lays out his or her goals for the next legislative session, which is ripe for further analysis (Herzik 1991; Coffey 2005; Heidbreder 2012). Policy entrepreneurs, as a type, are governors who can use their political resources to achieve internal legislative victories and engage in the

policy diffusion process through external networks (Kingdon 1995, Mintrom 1997, Harrigan 1998). This feeds into policy diffusion as a mechanism of innovation adoption.

Policy Entrepreneurs. Policy Diffusion, and the Adoption Gap

There is ample empirical and intuitive evidence that policies spread from one state to another. There are multiple models for the shape and speed of the diffusion. While observations about the pattern of diffusion reveal the nature of the policy process, the focus here is on the mechanism of diffusion, particularly the governors as policy entrepreneurs internally and through intergovernmental networks, and the closing of the adoption gap between the early enactors of innovation and the states that are laggards with regards to clean energy and climate actions.

Policy entrepreneurs share characteristics of business entrepreneurs, but are risking political rather than financial capital and are seeking political and policy outcomes rather than profit through recognizing a need for innovation. Examples of governors who have acted in an entrepreneurial manner abound. Osborne (1990), in a book with a foreword by then Arkansas Governor Bill Clinton, highlights examples of cases during the 1970s and 1980s where innovative states, with industrious governors, took initiative because the federal government had reduced its functions in the era of President Ronald Regan's devolution and public sector budget reductions. The governors shifted the national agenda through a bottom-up approach in economic, social, educational, and environmental programs. The case studies of this bipartisan group of governors, including the future President Clinton and the defeated Democratic nominee of 1988, Governor Michael Dukakis, show reform minded leaders within their states who built recognition for their models of innovation on the national stage. In considering the characteristics of policy entrepreneurs the internal and external activities of these actors is a defining feature of their existence and role in diffusion theory.

Policy entrepreneurs are not just politicians. In fact, this class of actors can include lobbyists, policy analysts, and other key players in the policy process. They can be bureaucrats (Roberts & King 1991), legislators (Mintrom 1997), and non-governmental organizations (Koski 2010). Roberts and King (1991), through a series of interviews, establish categories of entrepreneurial activities:

- Idea generation activities;
- Problem framing activities;
- Dissemination activities;
- Strategic activities;
- Demonstration project activities;
- Activities cultivating bureaucratic insiders and advocates;
- Collaborative activities with high-profile elite groups;
- Activities enlisting support from elected officials;
- Lobbying activities;
- Activities attracting media attention and support;
- Administrative and evaluative activities.

In the case of the governor, his or her staff and political surrogates can engage in some of these activities on his or her behalf. In order to drive innovation, and diffusion, these agenda setting and partnership building actions, however, will be part of the equation for adoption.

Policy entrepreneurship and gubernatorial leadership are not the only reason that policies move from place to place. Shipan and Volden (2008) hypothesize the mechanisms of diffusion as learning, economic competition, imitation, and coercion in their study of anti-smoking policies. Economic competition and coercion fit within the competitive federalist theory on why states emerge as leaders. The role of the governors as policy entrepreneurs rests on their activities to engage in learning- and teaching- with imitating- or serving as modelers of effective policymaking. Economic determinism is present in the diffusion of policies in climate and clean energy, but the leadership,

particularly where the simplest, non-externality-based, short-term economics appear unfavorable, requires the facilitation of the political actors. Making these contentious choices often requires political risk, but knowledge and experience can facilitate this process.

A question at hand is where and how does this learning take place. Using Swiss cantons (states) and their health policy outcomes, Fuglister (2012) uses event history analysis accounting for the impact of neighboring state adoptions. Her results indicate that intergovernmental committee membership does lead to adoption and that jurisdictions learn from one another's policy and political successes and failures through these intergovernmental networks. She concludes, "Observing [institutions] interactions in intergovernmental networks will contribute to a better understanding of the policy changes in federal states."

Nonpartisan national intergovernmental associations, such as the National Governors Association (NGA), US Conference of Mayors, and National Association of Regulatory Utility Commissioners (NARUC), are translocal organizations of governmental actors (TOGAs) that play a significant institutional role in facilitating networks for their state and local level. NGA (2013), for example, hosts numerous meetings and has a Center for Best Practices that allows governors and their staffs to engage one another on successes and failures in addressing common problems. In addition, NGA and similar TOGAs have committees and departments which lobby and exchange information with the federal government. Cigler (1994) performed a peer-reviewed study of state-level associations of counties to determine their agendas and role in the policy process. Her focus was on the efforts and issue areas of the county

associations in influencing state legislators and officials, and not on the interaction of county members within the organizations. She does note, however, that large counties have a disproportionate level of representation and interest in the associations' activities, at both the state and national levels.

The American intergovernmental groups play a unique role in the federalist structure in comparison to other nations. Bolleyer (2006) describes these organizations as vertical and integrated. She notes that their participatory nature and power encourages cooperation between the state and local and federal governments, as well as competition for federal resources. Bolleyer theorizes that the structure of these institutionalized intergovernmental relations actually serves to limit the role of subnational governments, in contrast to Canada and Switzerland, because they weaken the horizontally structured political system. Bolleyer, however, did not empirically test her assertion and notes the importance of the constitutional role of state governments in protecting autonomy. Thus, while these organizations play an important function in federal relations and developing similarities of policy design among the jurisdictions, their actual authority over the members is limited and exists as a conduit in the intergovernmental relations arena.

In a study of the National Association of Insurance Commissioners (NAIC), Balla (2001) refers to that group as a "professional association." Walker (1969) uses a similar terminology and describes how these organizations do not just move ideas, but also move qualified people in specialist positions between employment opportunities across jurisdictions. In fact, the associations are a professional development opportunity for their members. Former chairs of the NGA (2013) have become Secretary of Homeland

Security (Janet Napolitano of Arizona), Attorney General (John Aschcroft of Missouri) and President of the United States (Bill Clinton of Arkansas).

Balla's (2001) study is of the diffusion of a specific piece of state-level legislation, the Health Maintenance Organization (HMO) Model Act as NAIC members and staffers had developed to help spread this policy innovation. The time series model found that participation of Insurance Commissioners in relevant committees was a determinant in state-level adoption of the HMO Model Act. While this study's scope only reflected one specific policy innovation, it relates to a specific subsystem in the policy process, as will the forthcoming analysis.

A recent study in this policy subsystem related to green buildings found that state and local officials engage organizations as "knowledge brokers" in the diffusion of best practices, including in the adoption of popular Leadership in Energy and Environmental Design (LEED) standards (Koski, 2010). In this case the organization was an industry association, the US Green Building Council (USGBC), but the results of the paper emphasized its role in the exchange of technical information and the diffusion of a low salience policy. Resnik, Civin, and Frueh (2008), who advance the term and acronym for translocal organizations of governmental actors (TOGAs), offer an analysis of the role of the TOGAs, both in the United States and internationally, in bringing global climate agreements to the local level. Although climate change and energy crises are international issues that require an international framework, there is a clear role for the local level adopters and implementers and their representative groups in securing the energy and environmental future.

The governors themselves recognize the role of NGA. Governor Bill Richardson (2008), the former US Ambassador to the United Nations, US Secretary of Energy, and 2008 presidential candidate, provides some anecdotal evidence that NGA has helped climate and energy policy diffusion. He considers energy and climate change the “single largest challenge” for public policy in this book, which appeared ahead of his unsuccessful long-shot presidential campaign. Governor Richardson describes his excitement after USA Today highlighted his climate change executive order during an NGA meeting, “That kind of recognition gives a governor a warm feeling inside, carbon free.” While he does not use the term himself, the governor considers himself a policy entrepreneur who had the motivation and experience to initiate progressive energy policies after the previous administrations in New Mexico did little to address related problems. Lee and Koski (2012) define political leadership in their diffusion study of green building at the local level as those who have signed on to a climate agreement organized through the US Conference of Mayors, the city-level analog to NGA. They discover:

Mayors who sign climate agreements [...] could simply do so for rhetorical or political purposes. However, our hierarchical analysis shows that these signatory decisions represent leadership that results in substantive actions that contribute to meeting climate change reductions spelled out in the agreements. Mayors, in some ways, are classic policy entrepreneurs in that they attach a particular policy whose effects are wide-reaching (green buildings) to solve a specific problem (climate change), thus localizing the impact of the policy to fit a particular political environment.

Thus, understanding the dynamics of the national networks through NGA’s chairmanship and committees- and its Securing a Clean Energy Future Initiative of 2007-2008- for the state-level approach to mitigating greenhouse gas emissions will be part of the development of the understanding of the activities of these entrepreneurs.

Energy and environmental policy is especially ripe for entrepreneurial politics. In analysis of power dynamics of the adoption of the Regional Greenhouse Gas Initiative, Cook (2010) writes of the importance of entrepreneurship from leaders looking to adopt a cap-and-trade system with concentrated costs but distributed benefits; a difficult calculus requiring political capital. Innovation in environmental policy is not acute, but rather “incubated,” requiring understanding and dissemination of scientific information (Carley 2010). There are, however, politicians in states who want to frame themselves as “Mr. Climate Change” or “Ms. Climate Change,” whether its to protect their local resources and shorelines or push the agenda of an intergovernmental organization and drive policy diffusion (Rabe 2004). As one might expect from reading the news today, partisan consideration helps drive who take on the Mr. or Ms. Climate Change titles

The second hypothesis is that the State Energy Program Recovery Act resources reduced the policy adoption gap between early enactors and laggards in clean energy financing and regulation. It is through rapid policy diffusion that laggard states in climate and clean energy policy could utilize the financial resources of the Recovery Act to close the adoption gap with early enactors. The constraints of policymakers also drive policy diffusion in the competitive environment. Governors, legislators, and administrators do not have the time, resources, or need to reinvent public policies. Boundedly rational decisions result from the heuristics required to act with imperfect information in a quick and decisive matter. In discussing technological diffusion, Brown (1981) states, “individual behavior, adoption in the present context, does not represent free will so much as a choice within a constraint set [...]” Weyland (2006), in a generalizable, qualitative study of policy diffusion in Latin America, concludes, “the wave-like spread

of bold, neat policy models is shaped by cognitive shortcuts.” He shows that external pressures on boundedly rational actors have shaped pension reform and health care in this region. Karch (2007), in studying the United States, also notes the importance of heuristics with the pressures of time and electoral challenges. In fact, Boushey’s (2010) data reveal that there is a strong relationship between the level of innovation and the level of internal political competition in the state. Polsby (1984) also traces the source of policy, looking at both diffusion and the internal determinants.

Research in policy diffusion and understanding how jurisdictions learn from one another has rapidly expanded in the academic literature in recent years, particularly in the fields of American politics, comparative politics, and international relations (Graham, Shipan, & Volden 2008). In a seminal work of policy diffusion Walker (1969) defines a state-level policy innovation as something that is new to the particular state, regardless of whether or not other states have this policy on their books. He distinguishes between policy adoption, as the focus of his study, and policy creation or invention. Both adoption and invention are internal governmental actions, but adoption can arise out of external diffusion. The goal of Walker’s paper is to see why certain states, based on local characteristics, are more prone to the adoption of policy innovations.

In another influential article, Gray (1973) looks beyond generalized diffusion and focuses on the specific issue areas of education, welfare, and civil rights. She finds that innovative states are wealthier and more economically competitive, and that different issues have different patterns of diffusion, thus rejecting a theory for generalized innovativeness. Economic analysis from Kahn and Mansur (2010) shows the effects of energy costs and industrial presence in the states in determining levels of energy and

environmental regulation. The endogenous economic structure and locational impacts of jurisdictions are key variables in the policy diffusion model, but national-level interactions, particularly as states attempt to employ first-mover strategies or seek to compete in both the national and international system are still likely to play an important role.

The policy diffusion model that forms the basis for much of the current research in this field is from the work of Berry and Berry (2007). Berry and Berry's (1990) study of the adoption of state lotteries tested the theory of regional diffusion using an event history analysis to explain when and how state governments legislate to allow this limited form of gambling. The results indicate that both internal factors and the influence of neighboring states leads to the adoption of this policy innovation. Berry and Berry conclude that the event history analysis (EHA) used in their study, in which researchers look into the probability that a rare event- such as a major policy change- occurs at a particular juncture in time is a useful strategy in broad analysis of state level programs. The variables in their paper provide an overview of internal and external determinants, but do not explain the means of the diffusion. Berry and Berry (2007) have continued to extend and expand their research program, showing that diffusion patterns are not only regional, but also occur through national interaction models, isomorphic models, or leader-laggard models. In fact, although lotteries diffuse differently in comparison to environmental policies due to the efforts of state officials to prevent lottery spending from leaking into neighboring jurisdictions, cost shifting and retention of internal benefits are important in environmental decisions and legislation as well (Rabe 2011).

EHA continues to serve as the dominant model for policy diffusion studies, but there has been expansion of more advanced methods (Graham, Shipan, & Volden 2008). Berry and Baybeck (2005), for example, have integrated geographic information systems (GIS) into their research to help explore geographic patterns of diffusion. Boushey (2010), however, proposes a methodological framework for diffusion studies based on epidemiology. He discusses “policy outbreaks” and the “virulence” of certain policies in studying the diffusion of innovations in the same way one studies diseases. He develops an innovation index, in which the findings show that in the 50 states for 133 innovations “the political environment shapes patterns of diffusion.” Policy diffusion research is built on metaphors (Larson 2011), be they based on physics in the case of Berry and Berry (2007) or public health in the case of Boushey (2010). This area of policy science mimics the natural sciences in its quest to see how things (policies) move from place to place.

Boushey (2010) introduces the epidemiological method as an alternative in stating:

Diffusion research currently provides no framework to distinguish between the processes leading to the sudden diffusion of innovations like the amber alert, the gradual and steady diffusion of innovations like state lottery programs, and the episodic and periodic diffusion of public policies, such as term limits.

Figure 7 shows how policy diffusion and epidemiology can overlap, with the importance of the characteristics and disease spreaders-policy entrepreneurs. While this study will explore diffusion of various climate and energy policies over time and integrate the innovation index into the analysis, the focus is on the sudden response to ARRA and will also incorporate the traditional EHA approach to analyze the diffusion patterns.

Considering the Boushey model, politics appears to be the major “disease vector” in the epidemiological approach to climate and energy policy diffusion.

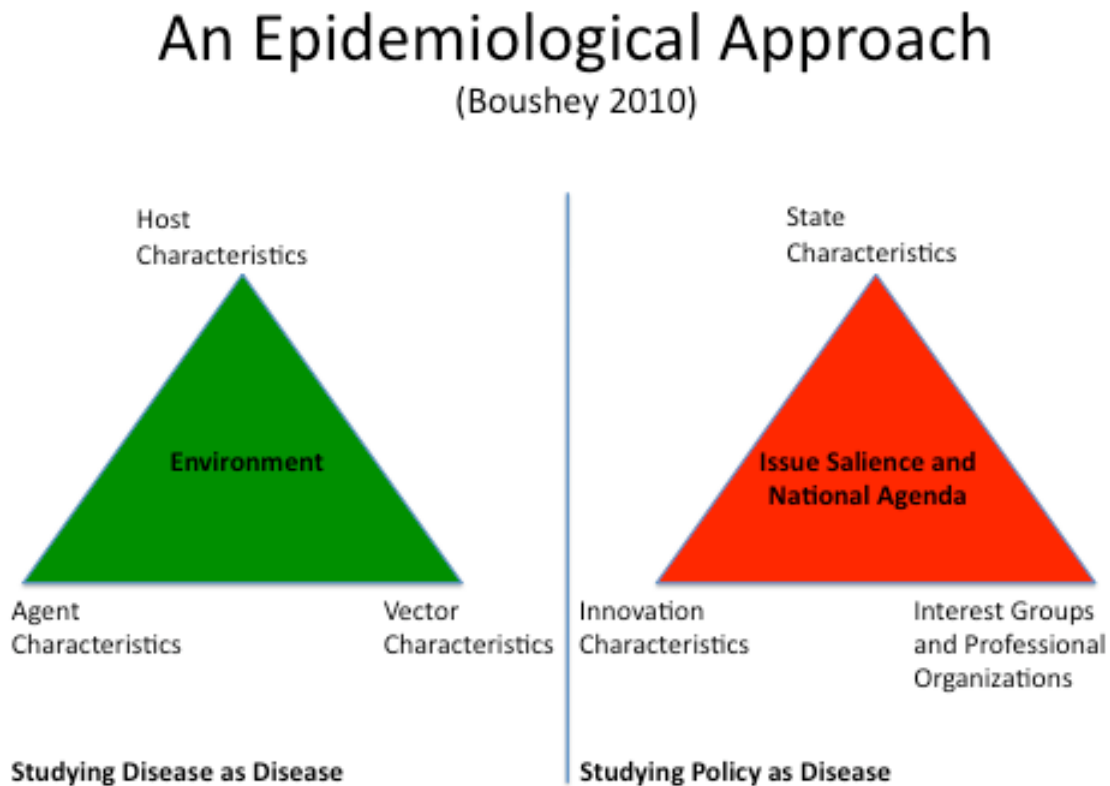


Figure 7- Policy Diffusion as an Infectious Disease

This analysis rests heavily on the leader-laggard model, which is among the diffusion patterns that Berry and Berry (2007) advance. It will use the data to establish a clear set of early-enactors and laggards for the key identified environmental policies. It will also explore the regional or national nature of the diffusion, with the hypothesis being that the innovation spread relatively evenly across the country as defined in the methodology. In addition, it will show the Recovery Act as an impetus of this change. While the welfare reform of 1996 created an opportunity for states to create a “welfare gap” by eliminating entitlement spending (deMause 2012), the additional resources of the

Recovery Act helped to alleviate discrepancies among states in the ability to finance energy policies and incentivized targeted climate and energy efficiency regulations.

The role of policy entrepreneurs, intergovernmental networks, and the Recovery Act will require empirical analysis to establish the diffusion of innovations and not just state responding to similar circumstances in closing the adoption gap (Volden, Ting, & Carpenter 2008). Due to the rapid nature of ARRA and the immediate need to allocate the funding, the expectation was that the models of innovation allowed the laggards to push ahead while the early-enactors simply utilized existing policy tools, but this did not bear out in the program designs. Burke and Ferguson (2008) write of the gap that this dissertation will analyze, “Scholarship that inventories American state action depicts a moving target as new adopter and innovators steadily appear.” Laggards are not always le to reach that moving target. Before establishing the early actors and leadership in the literature, the next section will discuss the importance of the politics and political rationality of policy entrepreneurship and diffusion in this leadership.

Politics and Policy

Leaders do not risk political or economic capital for public policies simply because they seem like a good idea; they need to find justification in the policy environment for their proposals. Rabe (2008) differentiates the different strategies of state politicians in handling the impending climate crisis. Prime-time strategies are those that directly address climate mitigation or adaptation, such as carbon cap-and-trade. Opportunistic strategies, such as renewable energy development, are policy plans that have additional benefits beyond climate change solutions. Finally, stealth strategies attack climate change without framing them as climate change related actions. Co-benefits of climate change regulation are the environmental, public health, and economic benefits (IPCC 2007) that can facilitate opportunistic and stealth strategies, as well as provide additional justification for prime-time options. In fact, a cap-and-trade or carbon tax can yield a “double-dividend” through an increase in revenues for the government (Keohane 2009), which could allow policymakers to cut other taxes or budget as they see fit. Rabe’s (2008) outlined motives for state action in this policy subsystem are economic self interest, impacts of climate change, setting tone, innovation in policy networks, and the bottom-up approach. Thus, the final hypothesis will use statements and policy to determine that justification for climate and clean energy activities in the states shifted from environmental to economic rationales from 2001 to 2012.

Politicians always operate with both policy and political goals in setting their priorities (Stone 2002). There is an important intersection between good politics and good policy, which can create a challenge in designing programs relating to the complex and contentious wicked problem of climate change. Survey data from Lachapelle, Borick

and Rabe (2012) find that Americans have uniform beliefs regionally on the existence of anthropogenic climate change and 62 percent believe that their state governments “have a duty to address global warming in the absence of federal initiatives.” In understanding California’s leadership on this issue, Rabe (2007) finds that public concern and susceptibility to adverse climate events drives innovation. Cost externalization and benefits internalization also impacts California policy. For example, since California does not produce many automobiles or parts compared to all of the cars on its roads the costs are borne out in other states or countries while the fuel economy and cleaner air benefits Californians (Raimondo 1992; Rabe & Mundo 2007). In addition, events such as hurricanes can sway public opinion towards a desire for climate action (Gulliver & Wheeler 2008).

The majority of the American public also believes that state action should not be conditional upon other governments taking action (Lachapelle, Borick, & Rabe 2012). There is established evidence that states and the federal government interact with one another in the energy and environmental arena. Frederiksson and Millimet (2002) developed a model to understand the role of strategic actions with states as the actors within the environmental policy arena, particularly within regions. They found that these strategic interactions are particularly prominent in the Northeast and West. There is also interaction between states and the federal government. Millimet (2006) uses empirical data to show that states improved environmental outcomes to overcome the declining regulation during the years of President Ronald Reagan’s administration. As noted above, a driving premise of this dissertation is that competition and rational strategic interaction drove the diffusion of strong carbon mitigation policies in the states.

The National Renewable Energy Laboratory (NREL 2012) characterizes the policy drivers for state and local activities as environmental policy, economic development, and energy security. Table 2 shows the priorities by driver type. These characteristics are useful for indentifying policy priorities. World events helped shape these priorities from 2001 to 2012. In the early part of this period, homeland security after the attacks of September 11, 2001 and the California deregulation debacle pushed energy security. Environmental priorities gained prominence mid-decade with the growing public attention towards climate change, while the economic crisis has dominated all policymaking since the start of the downturn.

Table 2- Assessment of State Clean Energy Policy Effectiveness: Policy Drivers (NREL 2012)

Environmental Policy	Economic Development	Energy Security
<ul style="list-style-type: none"> • Clean Air Benefits • GHG Emissions Reductions • Reduced Water Use • Reduce Water Pollution • Reduced Fuel Extraction Impacts • Preserve Sensitive Areas • Protected Species • Minimize Human Impacts 	<ul style="list-style-type: none"> • Job Creation • State Economic Growth • Minimize Energy Variations • Minimize Consumer Impacts • Energy Price Stability • Revitalize Rural Areas • Attract New Investment • Develop Locally Owned Assets 	<ul style="list-style-type: none"> • Abundant Energy Supply • Affordable Energy Supply • Reduce Transfer of Wealth Outside the U.S. • Net Export of Energy • Diversify Energy Resources • Peak Demand Reduction • Resilient Grid System • Encourage Distributed Energy Generation

Policymaking in modern society is an interdependent contextual process (Hajer 2003). “Next generation” environmental policies require comprehensive approaches (Pautz 2010). Economic considerations are always on the minds of environmental policymakers. “The economic desirability of environmental policy instruments depends on (1) the value of the expected environmental benefits, and (2) the costs at which environmental improvements are achieved,” write Kemp and Pontoglio (2011) in their study of eco-innovation. While cost benefit analysis techniques can monetize environmental investment, the politics, goals, and metrics of environmental policy through clean energy deployment and climate change mitigation and economic development policy through clean energy deployment and climate change mitigation are observable and different.

Green jobs and the green economy- moving the intersection of environmental and economic policy from green policies with as limited as possible direct balance-book financial harm to green policies fostering economic development- are relatively new concept in the policy discourse. The Obama Administration has, in fact, focused its climate policy proposals on the potential co-benefit of “green jobs” from the research, development, and deployment of clean energy technology as a means to improve the domestic economy (Jones 2008; Rosencrantz & Conklin 2010). Vice President Joseph Biden (2009) defined green jobs as careers that “provide products and services that use renewable energy resources, reduce pollution, and conserve energy and natural resources.” These jobs were the selling point for ACES. In a publication of the Office of the Speaker of the House, Majority Leader, Committee on Energy and Commerce and the

Select Committee on Energy Independence and Global Warming (2009), jobs, energy independence, reducing energy costs and ensuring industry can meet the challenges appear as the primary goals of the Waxman-Markey legislation. While the document also highlights the environmental benefits of reducing carbon dioxide emissions 17 percent below 2005 levels by 2020 and 83 percent by 2050, the primary arguments from the Democratic leadership were that this bill would improve the American economy. Through investing in technology and fostering a domestic clean energy economy proponents of ACES in the House of Representatives believed that Americans at all socioeconomic levels will not only have cleaner air, but also more money in their pockets.

Clean energy economics is a developing and contentious field in which there remains debate over the benefits or consequences of directed investment. CRA International (Montgomery et al. 2009), in a report for the National Black Chamber of Commerce, conducted economic modeling that showed 3 million fewer jobs in the American economy in 2050 (compared to the business as usual forecast) assuming the provisions of the American Clean Energy and Security (ACES) Act of 2009. The job losses, according to CRA International, occur because ACES may change investments away from the optimal market equilibrium, and the price changes and technological development will hinder the expansion of the American economy to meet labor needs. On the other hand, ACEEE (2009) provides analysis that shows the energy efficiency provisions alone in ACES would grow the economy by 600,000 jobs by 2030. A model from the University of California at Berkley provides output showing that the country

could gain 918,000 to 1.9 million jobs through climate and clean energy policy by 2020 depending on the rigors and effectiveness of the provisions (Roland-Holst & Karhl 2009)

The Political Economic Research Institute (PERI) at the University of Massachusetts at Amherst has also produced numerous positive economic forecasts of clean energy policy that have received the attention of the media and policy-makers (Office of the Speaker et al. 2009). In a report for the Center for American Progress, PERI economists estimate that a \$100 billion stimulus investment in clean energy could create 2 million jobs in the United States (Pollin et al. 2008). In a further analysis, Pollin, Heintz and Garrett-Peltier (2009) estimate that a \$150 billion spending move away from fossil fuels to clean energy would lead to a net gain of 1.7 million jobs (2.5 million gained in the clean energy sector, with 800,000 jobs lost in the fossil fuel industries). According to their assumptions, this would reduce the national unemployment rate by one full percentage point. On a regional level, Deitchman, Brown, & Baer (2011) use a similar methodology to find that “policies to promote process improvements, incentivize plant utility upgrades, and deploy combined heat and power in industry in the South could lead to higher levels of employment through 2030 in a region that accounts for more than half of the nation’s industrial energy consumption.”

Not all energy jobs are clean. Geri and McNabb (2011) proclaim, “They [state regulators] are pinned between conflicting pressures to protect the environment, but also to say ‘yes’ to energy projects that offer badly needed economic development to cash-strapped communities.” The hydraulic fracturing (fracking) technological advancements to access natural gas reserves and the Keystone Pipeline debate of recent years have shaped the dialogue. As Daniel Yergin (2012) recently editorialized, “This new reality

requires a new way of thinking and talking about America's improving energy position and how to facilitate growth in an environmentally sound way [...]". Although the focus of this analysis is on energy efficiency, renewable energy, and alternative carbon mitigation techniques, advances in fossil fuel access are certainly part of the policy environment in which policy learning, policy diffusion, and policy adoption occur.

With all of the competing priorities, government ideology is an important indicator in the policy process (Berry et al. 2010). The words of the governors in the public sphere are an important indicator of these beliefs (Habermas 1973). Beyond just mere words, however, analysis of the functional policies is necessary to assess this shift (Stone 2002). As is clear (NREL 2012) some policies are better for environmental outcomes (cap-and-trade) and economic outcomes (tax incentives). Rabe (2011) summarizes, "no two [states] will likely frame such policy options in identical fashion or have comparable capacity to formulate policy." These differences will reveal priorities and opportunities of state policymaking.

While ACES did not become law, ARRA's SEP provisions did. Recalling Wildavsky's (1998) birthday cake metaphor for competitive federalism, the federal government through the SEP ARRA was providing the redistributive resources for consumption while the states were choosing the ingredients and designing this cake of clean energy policies to their own tastes. Based on the importance of economic development for states in competitive federalism and regional systems of innovation (Peterson 1995; Chapple et al. 2010), it is logical that states led in this area for economic development reasons. The next section will provide the evidence of state leadership- where leadership is a level of adoption and investment in relevant policy innovations that

is beyond the policy environment of other jurisdictions (states and/or the federal government) at the time of enactment and offers a policy model for receptive innovators- as a precondition for the hypothesis testing as to what drove state-level climate and clean energy leadership from 2001 to 2012.

Leadership in the States

In 2007 Gov. Jon Huntsman appeared in a television commercial with California Gov. Arnold Schwarzenegger and Montana Gov. Brian Schweitzer (a bipartisan group) set in a natural background, noting the successes in climate policy in the states, and urging Congress to take action on mitigating greenhouse gas emissions. It was a direct competitive federalist challenge from the states to the federal government on climate change, urging the “top” to follow the bottom-up efforts. Paid for by the Environmental Defense Fund, the governors declared their leadership on the airwaves, a leadership in the states- particularly in early enactor states- for which there is ample evidence in reports, articles, and books to back up their claims. “These state programs, of course, lack the political sex appeal of an international trading regime for greenhouse gases,” writes Rabe (2004), but that does not preclude them from making progress.

As noted earlier, the opportunity for states to lead arose in the wake on a lack of stringent and comprehensive law on climate and clean energy at the Federal level (Engel 2009). Even with bipartisan, industry, and environmentalist support, and even with President Obama promising climate change as a priority, the House passing ACES, and legislative deal-making in the wake of the attention on the fossil fuel energy industry from the Deepwater Horizon disaster in the Gulf of Mexico, the Senate could not pass a bill in 2010. Regional coal dependence, a lack of specific public attention to the issue, and the difficult navigation through the senatorial process led to a failure in the effort Senator John Kerry, Senator Joe Lieberman, and Senator Lindsey Graham had spearheaded (Lizza 2010). While the Senate had made progress 13 years after Byrd-

Hagel, the opportunity and action in the United States remained at the sub-national level in the period under consideration.

Sapat (2004) defines environmental policy innovation as states going beyond the Federal requirements in environmental regulations. Adapting this vertical federalism definition, horizontal leadership between states can be going beyond one another on the relevant issues. Due to the political and economic variables under consideration, and the nature of leader-laggard models in policy diffusion (Berry & Berry 2007)- particularly under severe time constraints- this leadership from entrepreneurial states and governors can provide models of innovation for receptive innovators. This includes the spread of policies across states and federal interest in expanding program from the laboratories of democracy to the national level.

Many scholars have explored the state-level factors the influence energy policymaking. Internal determinants are a significant factor in clean energy policy adoption (Matisoff 2008). Metcalf's (2008) study finds that rising per capita income and higher energy prices reduces energy intensity (energy consumption per dollar of gross state product), controlling for different types of economic activity. Among the variables found to influence energy intensity are price, the state economy, capacity utilization of, investment, population, climate, and innovation- both technological and policy innovation (Bernstein et al. 2003). With the variety of states, therefore, it is no surprise that there were a variety of policy innovations in this period.

Adopting new policies is vexing within modern political institutions, particularly for issues such as climate and clean energy that often fail to the top of the policy agenda. New Jersey emerged as the original leader among the states in this policy subsystem in

the 1990s, with bipartisan entrepreneurial leadership from the governor's mansion across administrations. Governor Christine Todd Whitman, however, was an example of a politician who could not take this sort of leadership from Trenton to Washington when she became EPA Administrator (Rabe 2004). In addition, in the ebbs and flows of the policy world, current Governor Chris Christie has further pulled back New Jersey's efforts. Whether or not policymaking at the state level is easier, the institutions have proven more nimble and adaptable in adopting this sort of legislation (even if these laws are also easier to appeal).

The internal politics of states impacts state-level environmental policymaking. Influence from business can be particularly active in these debates (Rabe and Mundo 2007). Krause (2010) finds that manufacturing can be an obstacle while a liberal ideology can be a driver. Entrepreneurial policymakers can foster the coalitions that lead to adoption (Rabe 2011). In addition, as the role of bureaucrats and others inside and outside of government is important in this policy process (Sapat 2004; Rabe 2007), state and local level governance can be more open to participatory efforts to develop changes in policy (Norton 2005; Salkin 2009; Geri & McNabb 2011). These political efforts, initiated at the top and pushed through state institutions, have real impacts in addressing climate change and deploying clean energy.

American states use as much energy as many nations around the world. In the year 2000 Texas emitted more carbon dioxide than the United Kingdom or Canada and California emitted more than France or Australia. Peterson and Rose (2006) summarize, "If US states were compared to other national jurisdictions, they would represent 35 of the world's top 75 carbon emitters." While they continue that the imbalance of state

policies can cause inequities, they see state and regional efforts as a model towards overcoming to barriers of scientific challenges and political will to climate change legislation. As mentioned earlier, the international community has recognized the role and opportunity of encouragement and collaboration on state efforts, with state joining the global dialogue at various climate conferences (Selin & VanDeveer 2010).

These actions have provided models for Federal proposals, including cap-and-trade and renewable portfolio standards at the national level. Regional collaboration has overcome “institutional deadlock” and created new mechanisms for climate and clean energy action (Byrne et al. 2007). These policies are more than symbolic. Lutsey & Sperling’s (2010) detailed accounting of state climate policies and commitments as of 2007 indicated that an aggregation of goals could maintain 2010 emissions levels by 2020 across the country. While this may not eliminate the need for a comprehensive Federal law and fully-implemented international treaty, it is notable progress for development of the green economy and the low carbon future.

American states were not the only sub-national actors around the world pushing the climate and clean energy agenda. Australian states drove renewable energy development within their borders with the authorities they possessed on electricity regulation (Jones 2009). Unlike the United States, Australia eventually signed on to the Kyoto Protocol and in 2011 the Commonwealth (federal) government fully adopted a carbon-trading scheme. Canadian provinces, particularly British Columbia, also forayed into climate and clean energy action in light of the reluctance of Ottawa. Their role, however, was less notable and impactful than that of their counterparts to the south.

With many of the same motivations as states, American cities also moved in this area. Over a thousand cities have signed on to the Mayors' Climate Protection Agreement, committing their jurisdictions to the reductions in greenhouse gases required under the Kyoto Protocol (Lee & Koski 2012). As with states, cities and metropolitan areas have differing challenges and resources that they can put towards reducing their carbon footprints (Brown, Southworth, & Sarzynski 2009). From building standards to zoning and land-use to outreach, there are multiple policy options to address this wicked problem at the local level. In addition, local action is particularly conducive to participatory governance and public outreach (Salkin 2009).

The \$2.7 billion in formula funding for EECBG under ARRA, a program first authorized in 2007 under EISA, recognized and provided resources to cities to deploy energy efficiency technologies and practices. Under that program, however, states played a key role in technical assistance and coordination of activities, even holding responsibility for the funding for the smaller cities and towns in their respective states. State governments provide regulatory and financial support to cities that allows them to accept these green roles (Sciortino 2011). The city role is nothing to belittle, but in a constitutional system that gives states full oversight of local governments, it is difficult if not impossible to individualize the city effort outside of its state.

Leadership, or early enactors in this policy subsystem, among the states also has ample evidence. Rabe (2008) divides states based on the number of they have adopted out of an RPS, carbon tax, renewable fuel standard, carbon cap-and-trade, emissions target, emissions reporting, and vehicle emissions standards at the level of California. In addition, he also includes formal support of Massachusetts and its support of carbon

dioxide regulation in the 2007 Supreme Court case of *Massachusetts v. EPA* as one of the eight policies to count for adoption. Using counts as of 2008, twenty-two states had adopted two or more of these policies for a high level of enactment according to Rabe, who also divides states on their emissions growth trends. While these counts are useful, the analysis in this dissertation will also look at funding level and commitments to separate the leaders and laggards.

Think tanks and other research institutions also identify leaders and communicate their best practices. The American Council for an Energy-Efficient Economy's annual scorecard (Foster et al. 2012) of state energy efficiency practices and resources is a thorough inventory of state deployment efforts that garners attention of leaders (including mentions in State of the State Addresses). Reports of the National Renewable Energy Laboratory show trends and opportunities in state government, particularly with regards to renewable resources (Doris & Taylor 2009). Most significant to the gubernatorial network and closing the adoption gap, various white papers from the National Governors Association provide examples for closing the adoption gap that will appear in the empirical analysis.

Following the lead of much of the academic literature on policy diffusion, the focus of this work is on adoption and not implementation. The renewable portfolio standard in Texas, for example, had an effective design for exceeding its early targets in its implementation (Langniss & Wiser 2003). Even just having a climate plan has a "significant but modest effect" (Drummond 2010). On the other hand, design-flaws and economic challenges in California- as well as Europe- have hurt the carbon reductions through cap-and-trade (Barringer 2012; Reed & Scott 2013). Effective evaluation

techniques can help improve policies and show that they are achieving intended energy, carbon, and economic outcomes (Vine 2008). Implementation is critical in the policy process, but good policy must begin with adoption.

The forthcoming data will divide the early enactors and laggards focused on the policies in Table 2. It is worth noting that the Federal government has only adopted 3 of these policies (Tax Incentives/Rebates, ESPCs, and Green Government Policies), encouraged 2 through ARRA (building codes and decoupling), while ignoring or serving as a deterrent to the other 6. While further studies could show exactly how state leadership impacted federal legislation and executive action as laboratories of opposition, further details of state leadership will emerge as this study implements the methodology outlined in the next section.

CHAPTER 4

METHODOLOGY

This research requires a mixed methodological approach. Table 3 matches the hypotheses with the data, specific analytical methods, and software tools that will allow for rigorous testing of the literature-based assertions. While the comprehensive effort to address climate and clean energy is unique, these are widely-used methods in the policy science.

Table 3- Hypotheses’ Data, Statistical Methods, and Analysis Tools

	Hypothesis	Data	Statistical Methods	Analysis Tools
1	A national, bipartisan network of ambitious, entrepreneurial governors drove climate and clean energy policy innovation from 2001 to 2012.	State Energy Policies, NGA Information, State of the State Addresses, Political and Demographic Data	Event History Analysis, Network Analysis, Content Analysis	Excel, STATA
2	The State Energy Program Recovery Act resources reduced the policy adoption gap between early enactors and laggards in clean energy financing and regulation.	State Energy Policies, ARRA SEP Plans	Indexing of Policies, Content Analysis	Excel, STATA, Nvivo
3	Justification for climate and clean energy activities in the states shifted from environmental to economic rationales from 2001 to 2012.	State Energy Policies, State of the State Addresses, Economic Data	Content Analysis, Input-Output Modeling, Regression Analysis	Excel, IMPLAN, Nvivo, STATA

Although most of the operationalization is rooted in the theories of energy policy and the policy process, there are some discretionary decisions necessary to allow

rejection of the null hypotheses. On the first hypothesis, the “national, nonpartisan networks,” will need at least a quarter of membership from outside the majority party and membership from at least three of the major regional governors associations. As noted earlier, for the purpose of this analysis, ambitious governors are those who went on to seek the Presidency or Vice Presidency, chair a major governors association, or achieve a federal cabinet-level appointment, while policy entrepreneurs, as a type, are governors who can use their political resources to achieve internal legislative victories and engage in the policy diffusion process through external networks.

For establishing the adoption gap, a relative index of the adoption and investment levels in clean energy financing and regulation in the states will establish a relative distinction between early enactors and laggards based on number of policies adopted and per-capita policy-related investment to identify the gap. The index of adoption for relevant regulations (including codes and decoupling) will follow the methods of Boushey (2010), which categorizes states based on the rate of the adoption of innovations, while the index for investment (in SEP-related public sector and leveraged private sector clean energy programs) will be an adjusted annualized measure of per-capita policy-related expenditures, with early enactors as those states in the top-tier of these metrics. Analysis of Recovery Act programs and related policies will show how these two groups of states chose these programs using comparative metrics, particularly adoption, enforcement, and investment, to assess how ARRA impacted the relative gap. Under this hypothesis, while laggard states had the advantage of new resources to overcome the barriers to the adoption and investment for closing the adoption gap, the time-constrained early-enactors did not have new models to quickly develop and

implement for the Recovery Act programs. In a competitive environment, some states will lead and some states will be very slow to innovate, but redistribution can push the rapid expansion of innovation into new jurisdictions, as shown earlier in Figure 1.

Finally, for the third hypothesis coding of the gubernatorial statements will be an iterative process to identify the proposals and trends for the justification of climate and clean energy policies based on the codebook of the Policy Agendas Project at the University of Texas at Austin (2013) and the policy drivers in Table 2 (NREL 2012). Heidbreder (2012), for example, adapted her study from this codebook to analyze trends in State of the State Addresses on social welfare and healthcare policy from 2000-2007, providing a model for this effort. Coffey (2005) also used State of the State Addresses to analyze ideology through computer-assisted content analysis. State of the State Addresses are a useful window into gubernatorial initiative, as they serve as a key indicator at the start of the legislative session into gubernatorial priorities for the term (Morehouse & Jewell 2004). This longitudinal analysis will compare coding of statements to the eventual policy adoptions and potential economic development impact (through I-O analysis) to show the change to justifications over time.

The data sources are also varied. The Database of State Incentives for Renewable Energy (DSIRE) (DSRIE 2013), operated out of North Carolina State University with funding from the US Department of Energy (DOE), is the most detailed and comprehensive source of state and local rules and incentives with regards to clean energy policy deployment, with regular updates to ensure the most current information. In addition, energy data from the Center for Climate and Energy Solutions (2013) and the Energy Information Administration (EIA) (EIA 2013) will supplement the analysis and

provide control variables. Reports from NGA and State of the State Addresses are downloadable from the internet. There were 534 State of the State Addresses or similar legislative addresses from 2001 to 2012 (not all states have such a speech annually) and this research has collected all of them for analysis. Acquired through a Freedom of Information Act request, the ARRA SEP plans included detailed proposals to DOE for spending the funding in the 50 states and commitments to building codes and utility regulations from the governors as required in the law. IMPLAN (2009) will provide background macroeconomic statistics, particularly for understanding green jobs. The development of input-output tables similar to methods employed in Deitchman, Brown, & Baer (2011) will help to categorize policies by their job creation potential and bills of goods will show how economic impacts by key industry in each state can impact policy.

As is clear from the literature, EHA is the preferred method for diffusion studies (Berry & Berry 2007). The additional analysis, however, will put a thorough emphasis on the competitive federalism impacts leading to state leadership. Blossfield, Hamerle, and Mayer's (1989) text will guide the statistical analysis and Miles and Huberman's (1984) classic tome on qualitative analysis will provide background for conducting the coding and dissemination of the SEP plans and speeches. Through the use of Nvivo for qualitative analysis, STATA for quantitative analysis, and Excel for data management, the next section will begin to answer the core research question, starting with the gubernatorial leadership in climate and clean energy from 2001 to 2012 within their states and at the national level. A starting point for this analysis, therefore, is the men who ran for the Republican nomination for president for 2012 before expanding to the

full population of American governors, including those who sought or attained federal offices.

Chapter 5

The Governors and their Climate and Clean Energy Policies

Arnold Schwarzenegger, Rod Blagojevich, Sarah Palin: the American governors' mansions of 2001-2012 had many intriguing occupants- including several nationally recognized household names- with personalities that provided citizens inspiration, material for mockery, and everything in between. 146 governors held this highest office in their respective states at the start of a calendar year for 2001 through 2012 (with various temporary place-holding governors running states on an interim basis that do not get included in this analysis). Republican governors held office in 51.3% of the state-years under consideration, with Democratic governors in the statehouse 47.0% of the time and Independents in office the remaining 1.7% of the 600 state-years from 2001-2012. As a point of comparison, 55.3% of the state-years were for states that were red states based on their support for the Republican candidate in the previous election (President Bush in 2000 and 2004, Senator McCain in 2008), with 44.7% as blue states that supported Vice President Gore, Senator Kerry, or President Obama in 2000, 2004, and 2008 respectively. The Blue State Republicans and Red State Democrats will provide intriguing points of analysis in state-level bipartisanship in the wake of Federal polarization going forward in this analysis. 62 of the 146 governors found themselves in this position during their terms.

The literature review established national ambitions as a reason why governors may have chosen this area of opportunity to make a name for themselves and their states. With the inaction in Washington and competition for a spotlight on the national stage among Democrats and Republicans, climate change and clean energy allowed governors

to show their abilities and competencies to advance contentious but effective public policies. Before analyzing the story across the country, this analysis will focus on the four states where former governors sought the Republican nomination for president for 2012. While the Republican electorate was not seeking candidates with innovative policies for climate and clean energy, within their states each of these national figures- Governor Mitt Romney of Massachusetts, Governor Tim Pawlenty of Minnesota, Governor Rick Perry of Texas, and Governor Jon Huntsman of Utah- advanced the political agenda and made policy progress in these areas.

Actions of Republican Governors Who Ran for President in 2012

The eventual winner of the Republican nomination for president in 2012 served 4 years as governor of Massachusetts. Massachusetts is a noted leader in climate and clean energy policies. It is a founding member of the Regional Greenhouse Gas Initiative (RGGI), a collaboration of nine Northeastern and Mid-Atlantic states to place a behavior-adjusting price on carbon dioxide emissions through a cap-and-trade system in the utility sector. It is the first multi-state economic mechanism for pricing greenhouse gas emissions to encourage mitigation. The Bay State currently ranks as the top state for energy efficiency policies in the United States according to the methodology of the ACEEE (Sciortino et al. 2011). It was the lead plaintiff in the landmark 2007 Supreme Court case that allowed the Environmental Protection Agency to regulate greenhouse gases under the Clean Air Act and its research and development operations in the Route 128 Corridor and beyond are working towards significant energy breakthroughs. Massachusetts currently gets over 6 percent of its electricity from renewable resources and has lower than average residential electricity consumption due to its mild summers with low demand for energy for cooling (EIA 2012).

The governorship of the Commonwealth of Massachusetts has had four occupants since the start of the Bush Administration, with Republicans holding office through the end of 2007 and Gov. Deval Patrick, the incumbent Democrat, taking office in 2008. Table 4 shows the governors and how often at least one reference to climate or clean energy appeared in the annual State of the Commonwealth address. The only reference to clean energy in a Republican State of the Commonwealth occurred in 2006 when Gov. Mitt Romney declared, “We will create a long range state energy plan that includes

conservation, renewable generation, and sites for new facilities.” Gov. Romney devoted significantly more time over his four years of addressing the legislature and people of Massachusetts at the beginning of the calendar and legislative year on matters of health care reform and education in the state.

Table 4- Massachusetts Governors’ Climate And Clean Energy References In The State Of The Commonwealth Address 2001-2012

Years Delivering the State of the Commonwealth (or Inauguration Address)	Governor	Party	Percentage of State of the Commonwealth Addresses with Climate or Clean Energy References
2001	Paul Celluci	Republican	0%
2002	Jane Swift	Republican	0%
2003-2007	Mitt Romney	Republican	25%
2008-2012	Deval Patrick	Democrat	100%

Since taking office, Gov. Patrick has touted his state’s proven leadership in energy efficiency. Every one of these speeches has touched on the theme of climate or clean energy, with 4 of the 5 arguing for the economic development potential but none of them building the case for the environmental benefits. Gov. Patrick has served primarily in the period of the current recession. Gov. Patrick was short on specifics in his clean energy statements, but makes a commitment for Massachusetts to lead in these areas, at one point criticizing political opponents for arguing against RGGI participation and hampering controversial offshore wind projects near Cape Cod. Despite its reputation and successes, governors of Massachusetts did not devote as much time in their annual speeches to this issue as occurred in the other states with 2012 presidential candidates.

Minnesota, the home of candidate Tim Pawlenty, has also had a strong record on matters of climate and energy. Rabe (2008) notes that Minnesota had both a high level of policy adoption on innovative measures but also an above average emissions growth rate among the American states. This state, however, also has a strong record on conservation, rating in the Top 10 in a recent ACEEE energy efficiency scorecard (Sciortino et al. 2011). Targeting its largest investor-owned utility, Xcel Energy, the state also has an aggressive policy to encourage renewable energy deployment (DSIRE 2012) and currently rates fourth in the nation in both wind generation and ethanol production (EIA 2012).

Table 5 shows that Minnesota had 3 governors, all from different parties, during this time period, with Republican Tim Pawlenty in office for the majority of these years. While Gov. Pawlenty did not address climate or clean energy in every speech, he discussed these issues in relative depth in terms of their environmental, economic, and national security implications throughout the course of his term. Based on the coding of his addresses, Gov. Pawlenty made 8 energy-related references to environmental issues, 8 references to economic development through climate or clean energy, and 5 references to national security with regards to energy. He was a strong proponent of biofuels, employing the widely-used Saudi Arabia comparison in 2005, “I would much rather have the fuel in our cars come from the Midwest than from the Middle East. Let's make Minnesota the Saudi Arabia of Renewable Fuels.” Three years later, he further pushed the foreign policy implications in declaring, “Minnesota should continue to lead efforts to "Americanize" energy production. We must help keep America from becoming an energy

hostage to hostile and unreliable leaders like Hugo Chavez, Vladimir Putin, and Mahmoud Ahmadinejad.”

Table 5- Minnesota Governors’ Climate And Clean Energy References In The State Of The State Address 2001-2012

Years Delivering the State of the State	Governor	Party	Percentage of State of the State Addresses with Climate or Clean Energy References
2001-2002	Jesse Ventura	Independent	50%
2002-2010	Tim Pawlenty	Republican	75%
2010-2012	Mark Dayton	Democrat	33%

Gov. Pawlenty made clear that his state and his office were leaders in this public policy subsystem, noting this leadership nine times over his eight annual addresses. He was particularly critical of the federal government as he tried to push Minnesota towards becoming the “renewable fuel capital of America” (stated in 2005), saying in 2006, “Let’s face it. Washington has been slow to lead on this issue. But we can’t afford to wait for them. Let’s lead the way and set a strategic goal of “25-by-25” - so that 25 percent of all types of our energy will come from renewable sources by 2025.” The state then adopted that particular policy. In 2007, introducing his “Next Generation Energy Plan” the same year he led the National Governors Association’s “Securing Our Clean Energy Future” Initiative, he told his state, “Our nation has been asleep at the switch on energy policy for decades. The good news is that while much of the country has just begun to hear the energy wake-up call, Minnesota has been an early riser. While others slept in on renewable energy, we got up early, we made the coffee, we cooked the breakfast, we read the paper, we did some chores and we took the dog for a walk.” He took personal initiative and aimed at a bipartisan effort, noting, “I look forward to working with the

Democrats and the Republicans to pass and sign comprehensive historic renewable energy legislation this session.” A year later he spoke of successes in ethanol production and other forms of renewable energy. His Democratic successor, however, has spoken little of these clean energy issues in recent years.

Texas is the only state in the Union to have only one governor since George W. Bush left that very office to become President, his former lieutenant, Gov. Rick Perry (See Table 6). In a state known for its oil and gas reserves, and which currently produces and consumes the most energy of the American states (EIA 2012), Gov. Perry has encouraged wind power, plug-in hybrid electric vehicles, and nuclear energy in his biannual State of the State Addresses (the legislature in Texas meets biannually). He has also criticized the Federal Energy Regulatory Commission and encouraged innovation to reduce air pollution. Texas is the only state with its own electricity grid and has made inroads in renewable energy technology deployment. Gov. Perry has also criticized and sued the Environmental Protection Agency for taking action on climate change through its endangerment finding on greenhouse gas emissions (Texas Office of the Governor, 2010).

Table 6- Texas Governor’s Climate And Clean Energy References In The State Of The State Address 2001-2012

Years Delivering the State of the State	Governor	Party	Percentage of State of the State Addresses with Climate or Clean Energy References
2001-2012 (Address delivered in odd-numbered years only).	Rick Perry	Republican	50%

Utah, the home state of Governor and Ambassador to China Jon Huntsman, has advanced its energy policy over the past decade. While it has the fifth lowest electricity prices in the nation, almost 5 percent of its electricity came from renewable resources (EIA 2012). Utah’s Republican governors (listed in Table 7) have addressed clean energy in all but two of the State of the State addresses since 2001. Mike Leavitt, who would leave office to become the EPA administrator, focused on energy supply security in light of troubles in his region due to the situation in California that led to blackouts and energy crises on the over-burdened and mispriced electricity grid. He criticized the source of the problem in telling his state’s lawmakers and citizens in 2001 “California consumers cannot be shielded from the true cost of power while major utilities are allowed to perish in bankruptcy and consumers in other western states are left to pick up the tab.” He went on to warn, “There are few things that could kill an economy or life quality like a lack of reliable electric supply. Due to complex economic, environmental and regulatory issues, the West has not kept up in developing energy resources.”

Table 7- Utah Governors’ Climate And Clean Energy References In The State Of The State Address 2001-2012

Years Delivering the State of the State	Governor	Party	Percentage of State of the State Addresses with Climate or Clean Energy References
2001-2003	Mike Leavitt	Republican	100%
2004	Olene Walker	Republican	0%
2005-2009	John Huntsman	Republican	80%
2010-2012	Gary Herbert	Republican	100%

The next governor to come to office through electoral victory, Gov. Jon Huntsman, drew on Utah’s interest in natural resources in arguing in 2007, “On the

energy front, Utah is uniquely positioned to assist in meeting the future needs of our State and nation. My 2006 Energy Efficiency plan, one of the most aggressive in the nation, calls for an increase in efficiency of 20 percent by 2015 and we are rigorously working to that end.” In 2008 he argued from an environmental perspective, “We must improve the air we breathe and capitalize on technology to ensure the long-term viability of our abundant natural resources, like coal, oil and natural gas, while developing renewable alternatives.” His successor, Gov. Gary Herbert, has continued to address these issues in depth in his State of the State Addresses

Figure 8 shows the context of clean energy references in these 4 states’ speeches. Over one third mention clean energy in the context of economic development, particularly since the onset of the global financial crisis. Both Democrats and Republicans mention environmental considerations, doing so in 26 percent of all the speeches. Energy security, including energy reliability came up in 5 speeches, while governors argued for the national security benefits of clean energy policy in 4 of the 42 addresses.

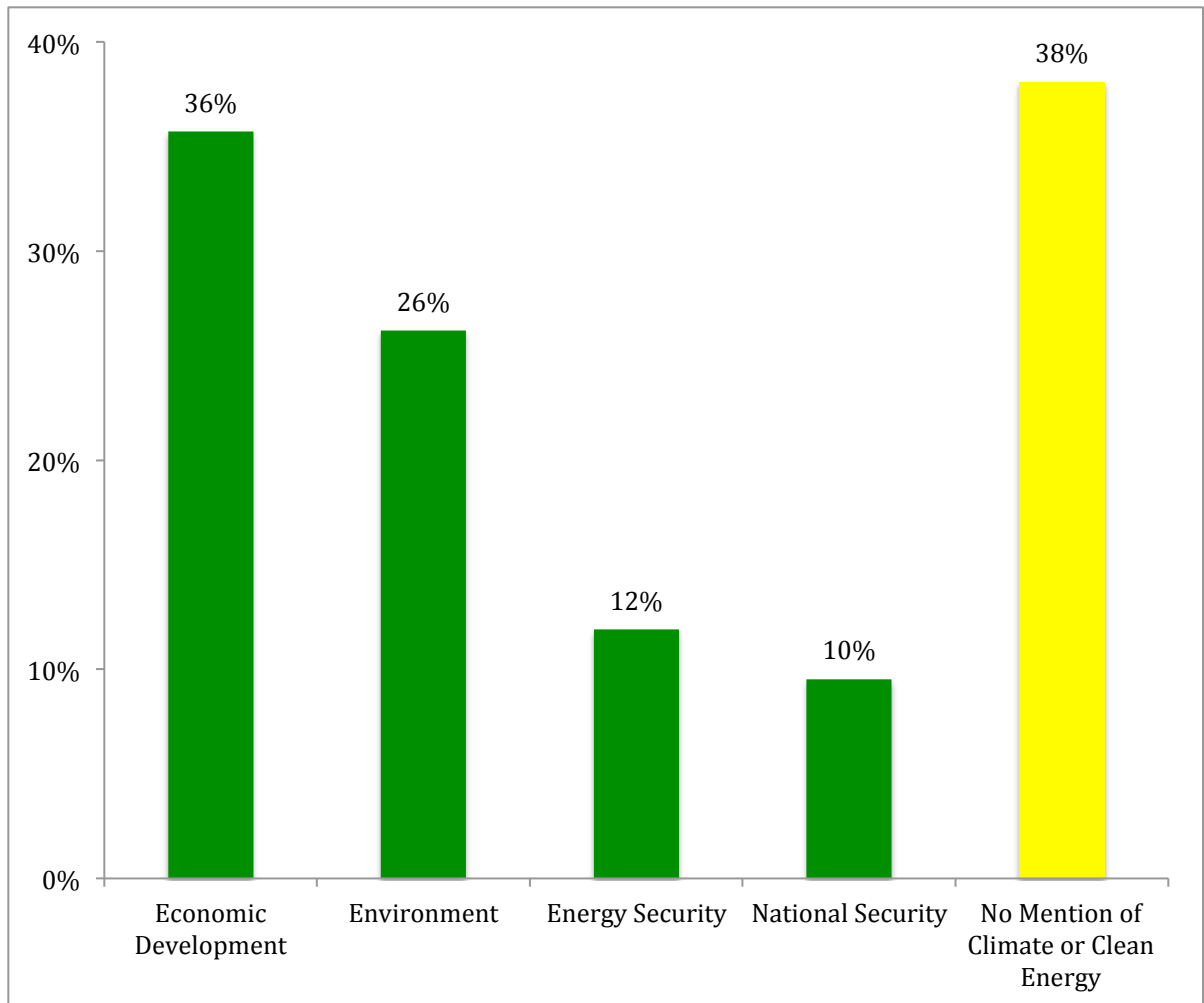


Figure 8- Percent Of State Of The State Addresses Referencing Clean Energy Issues By Type In Mass., Minnesota, Texas And Utah From 2001-2012

It is noteworthy that each of the leading 2012 Republican presidential candidates who served as governor addressed energy efficiency or renewable energy in a State of the State Address. Each state's governor put his or her own state's spin on the efforts. In 2008, for example, Gov. Pawlenty argued, "Clean energy will help our environment and outdoors, and that is a good thing. Enjoying the outdoors is part of who we are as Minnesotans." This sample, however, does not fully reflect national trends. In a comprehensive analysis of State of the State Addresses from 2012, the National Governors Association, notes that 15 governors discussed renewable energy and 7 speeches mentioned energy efficiency. This was almost always in the economic development context, with job creation through energy and other means being a primary focus of these speeches across the nation (NGA 2012)

While these governors addressed their specific state-level concerns, they also worked to impact the nation's climate and energy policies. Gov. Pawlenty chose this topic as his initiative (called "Securing a Clean Energy Future") while chairing the National Governors Association in 2007 and 2008. This was unique in the history of the NGA, as typical annual chairpersons' initiatives focused on the economy, education, and healthcare. He introduced his program in noting, "America is at a tipping point. As some of this country's leading policymakers, my colleagues and I have a unique opportunity to move the United States toward a cleaner, more independent, more secure energy future." (NGA 2008). Through the NGA network with a bipartisan cohort of task force members, his goals in this leadership position were to:

- Use our energy resources better through efficiency and conservation;
- Promote non-petroleum based fuels such as ethanol and biodiesel;
- Take reasonable steps to reduce greenhouse gas emissions; and

- Accelerate research and development of advanced, clean energy technologies.
(NGA 2008)

The NGA's work, funded in part by the federal Department of Energy and including a grant from Wal-Mart, included the dissemination of best practices and new ideas across the governors, their staffs, the states, and into the public. Whether the initiative was a cause or a symptom, it is clear that governors had united around these key clean energy issues in a network that had primarily focused on national security, healthcare, and education.

Gubernatorial Agenda Setting

As noted in the literature review, the governor wears many hats within his or her state and beyond the state borders. Figure 9 explores how these roles and responsibilities impact the adoption of public policies. The next section will explore how governors set the agenda, particularly zeroing in on EERS and RPS proposals that eventually reach the adoption phase of the public policy process due to this intervention.

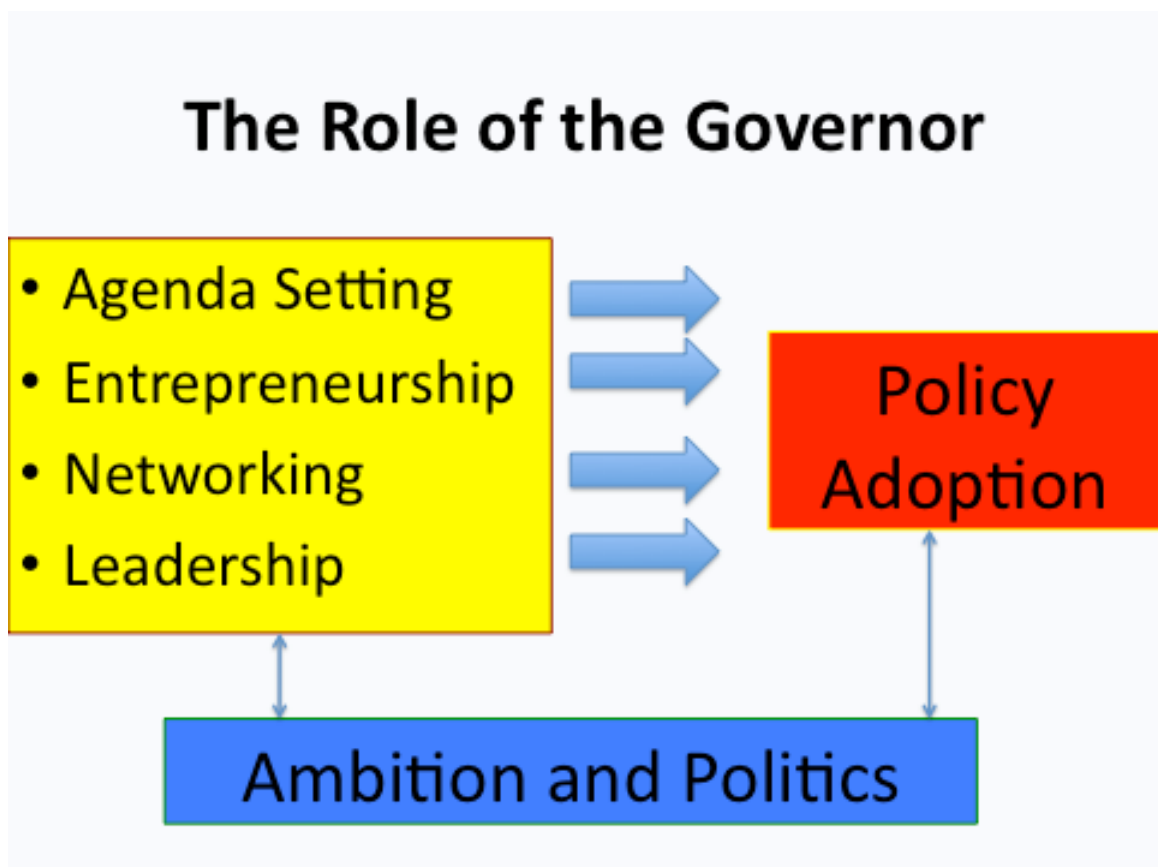


Figure 9. The Role of the Governor in Policy Adoption

A thorough analysis of the 536 State of the State Speeches between 2001 and 2012 found support for clean energy initiatives within 207 of the speeches (39 percent).

Figure 10 breaks down this information further. Renewable energy topics appeared in 129 speeches, while energy efficiency only received agenda setting mentions in 72 speeches, and the energy efficiency and renewable energy encompassing “clean energy” getting 50 mentions. Climate change efforts appeared 84 times when the governor made the state of the state address. Consistent with the broader public policy dialogue, “green jobs” a discussion point didn’t appear until 2008, but received 17 mentions over the years. While Republicans mentioned energy security and nuclear energy issues more than Democrats, Democrats mentioned all climate and clean energy topics significantly more often than Republican governors in t-tests.

Renewable Energy More Popular in the State of the States

- Any climate/clean energy topic= 207 speeches***
- Renewable energy and related= 129 speeches***
- Energy efficiency and related= 72 speeches***
- “Clean Energy”= 50 speeches***
- Climate Change and related= 84 speeches***
- Green Jobs= 17 speeches**

Total Speeches= 536

T-Test for Democratic Governor increasing likelihood of topic: *p<0.10 **p<0.05 ***p<0.01
Republicans discussed energy security and nuclear energy more than Democrats

Figure 10. Summary of Climate and Clean Energy Mentions in State of the State Addresses 2001-2012.

RPS and EERS provide a useful comparison point for understanding differences in the popularity of renewable and efficiency energy policies. They are both regulatory policies that essentially serve a similar function through direct requirements on utilities and power producers. In some cases, the RPS and EERS Based on the broader definition of EERS and RPS from the CC2ES (2013), 33 states had an EERS and 38 states had an RPS at the end of 2012. DSIRE (2013) uses stricter definitions to define these clean energy standards, limiting the alternative energy standards that allow for nuclear, carbon, capture, and storage, and other more controversially “alternative” technologies to clean energy advocates and environmentalists. The broader definition, however, allows for the diversity of signaling attempts from state governments that their jurisdiction is committed to a goal in the marketplace of utility electricity supply outside of carbon-intensive fossil fuels, including mandating or creating an objective for using energy efficiency as a resource to reduce consumption and mitigate harmful emissions.

For statistical purposes, the analysis is considering the EERS and RPS as a dichotomous variable, adopted or not adopted in each state year. For wind and solar to biofuel from swine feces and efficiency carve-outs, these standards are as varied as the states that are implementing them. A more thorough study of the specific regulations could calculate the size of the standards in comparison to the respective states’ utility portfolios to develop a relative index of the magnitude of the EERS and RPS policies. While there will not be a quantitative approach here, there can still be qualitative analysis of the interstate comparisons.

One distinction to draw, however, is between the regulations and goals. Regulations show a greater commitment through direct requirements on utilities and

other entities in the states, while goals simply set an objective. Of the 33 EERS, 9 were simply goals. There were only 7 RPS goals for the 38 total. Thus, there were 31 RPS regulations and 24 EERS regulations in 2012. While there has been discussion in North Carolina and Maine among other states of repealing these standards based on recommendations of the American Legislative Exchange Council- a free market interstate lobbying group- no state has yet repealed an EERS or RPS.

Finally, to understand intra-state dynamics, the entity adopting an EERS or RPS matters. In 2008, Governor Eliot Spitzer of New York stated in his State of the State Address:

On the demand side, we are committed to 15% by '15, the most progressive and attainable energy efficiency target in the country, which sets a goal of reducing statewide electricity use by 15 percent from projected levels by 2015. We approach this goal the way a business would, with a requirement that our energy investments produce savings well in excess of the cost of achieving them.

He was the only American governor of this period to address this topic in a State of the State Address. In New York, however, it was not the governor or the legislature that adopted the standard. The New York Public Service Commission (PSC) established the energy efficiency, as well as renewable energy standards in that state. In New York, the governor appoints the commissioners, while in states such as Georgia, for example, the public votes for the members of quasi-judicial utility regulatory authority that sets standards and electricity prices. In different states different authorities, be they the governor, legislature, or a judicial or semi-judicial branch of government or a combination of branches play different roles in setting utility standards and shaping rules and regulations for the energy portfolio. Distinguishing between legislative and

executive policy compared to judicial policy provides insight into the role of the governors, citizenry, and other officials on public policy.

While the most intuitive reason why a state may seek an EERS is to reduce the need for consumption in a state with higher electricity prices that can be a drain on the household, commercial, and industrial budgets, and the EERS is clearly not at the forefront of state agenda, politics and political values do play a significant role in adoption. Table 8 and Table 9 show event history analyses for the 425 state years in which the states could have adopted an EERS that was not yet on the books from 2001 to 2012. Table 8 shows that Blue States and Democratic governors are more likely to adopt EERS. Table 9 controls for the price impacts. The first analysis shows that the higher the average retail price of electricity the more likely a state will adopt an EERS or goal. Controlling for price, however, Blue States and states with Democratic governors- the second and third models respectively in the table- are still statistically significantly at a great risk to adopt the policy, based on the experiences over 12 years of the 33 states that did adopt EERS or goals and the 17 that did not. This is a dent in the argument that energy efficiency goals have bipartisan support, as Democratic leaning states- in both state politics and elections towards federal office- are more in favor of this policy option.

Table 8- Partisanship and the EERS

Multivariate Hazard Ratios	EERS or Goal- 33 states	EERS Requirement- 24 states	Legislative EERS Requirement- 18 states
Blue State	2.20***	2.65**	2.09
Democratic Governor	1.71	2.46**	5.46***

*p<0.10 ** p<.05, *** p<.01

Table 9- Event History Analyses for Likelihood of Adoption of Energy Efficiency Resource Standards or Goals as the Dependent Variable

N=425, Policy Adoptions=33, *p<0.10 ** p<.05, * p<.01**

Prob > chi2 = 0.0538	Coefficient	P> z
Average Retail Price of Electricity	0.094**	0.03
Constant	-3.509***	0
Prob > chi2 = 0.0265	Coefficient	P> z
Average Retail Price of Electricity	0.046	0.41
Blue State	0.752*	0.06
Constant	-3.352***	0
Prob > chi2 = 0.0222	Coefficient	P> z
Average Retail Price of Electricity	.089**	0.03
Democratic Governor	0.708*	0.06
Constant	-3.871***	0

Unlike EERS policies, RPS policies have garnered more attention of governors, but have not shown significant partisan differentials for adoption. Also in contrast to EERS only 2 states- rather than 6- went through utility commissions rather than the legislative process to establish rules and regulations mandating renewable and alternative electricity technologies. That said, there is a strong correlation between adoption of the two policies and, in fact, several states established EERS and RPS requirements in the same legislation. The states with an RPS or RPS Goal are 6 times more likely to adopt an EERS or EERS Goal. By 2012, 38 states had adopted an RPS or RPS goal.

Governors of both major parties have touted RPS policies in State of the State Addresses. Alaska Governor and 2008 Republican Vice Presidential Candidate Sarah Palin was one of 9 governors (3 Republican and 6 Democrat) to support such a policy before it passed in his or her state. She said in 2009, “This includes meeting my goal of generating 50 percent of our electric power with renewable sources. That’s an unprecedented policy across the U.S, but we’re the state that can do it with our abundant renewables, and with Alaskan ingenuity.” She was not the only governor to bring local resources into the discussion. Maine Governor John Baldacci argued in his 2008 State of the State Address, “In this energy crisis, we will develop renewable sources of energy made in Maine, by Maine businesses for Maine people.” Several governors spoke about the policy after its passage, including Governor Palin’s successor Sean Parnell who proposed financial incentives to support the RPS in 2011:

This comprehensive plan puts us on track to achieve the renewable energy goal we established, together, that Alaska will derive 50 percent of our electrical power from renewable sources by 2025. To get there, I’m asking you to move decisively and aggressively with me. Let’s work together this year to invest at least \$65 million to jump start planning, design, and permitting for the Susitna Hydro Project; provide at least \$25 million for renewable energy grants; \$10 million for a Southeast [Alaska] Energy Grant Fund; and \$25 million for weatherization.

Overall, 26 speeches of this era referenced the RPS in a supportive manner in 17 states, with Governor Baldacci’s Republic successor Paul LePage being the only governor to (unsuccessfully thus far) urge repeal of the policy in a State of the State Address.

The data show that there is not a statistical significance in the event history analysis of the likelihood of adoption with a Democratic or Republican governor. Blue States, however, are 3.8 times more likely to adopt an RPS showing that political culture matters. RPS diffused with economic development policy justifications, as governors

were able to connect resources in state to goals. One can talk about Minnesota's fuel crops or Texas's wind with pride in the local parlance, but it is difficult to specifically cite or show a comparative advantage on energy intensity improvements. While efficiency is often the cheapest, most cost effective, and consumer friendly improvement to mitigate emissions and reduce dependence on fossil fuels and- this research will later show- more prudent from an economic development perspective, local politics and resources appear more politically feasible. It appears that RPS policies are effective at promoting development and deployment of chosen alternative technologies (Yin & Powers 2009), but they also face challenges with competing resources, including cheaper energy efficiency resources (Piper 2013). 2007 was the most popular year to adopt an RPS or RPS goal and, as the next section will show, a key year for state energy policy action and dialogue.

The National Governors Association's Role in Energy Policy

The “Securing a Clean Energy Future” initiative was the 2007-2008 NGA chairman’s lead agenda item for the nation’s gubernatorial collective. It included meetings, lobbying, publications, small financial resources, to facilitate the leadership role of the states in establishing climate and clean energy policy actions. Analyzing this experience is not just a useful window into the specific policy subsystem dynamics, but also into how networking amongst the states at the bipartisan and national level can influence internal decision-making and intergovernmental relations.

In announcing the initiative, NGA (2007) summarized its goals:

Securing A Clean Energy Future will enlist the efforts of all governors to enact meaningful policies at the state level [...]. [It will] promote comprehensive clean energy policies at the state level that:

- Use our existing energy resources more wisely through conservation;
- Promote non-petroleum based fuels, such as ethanol and biodiesel.
- Take reasonable steps to reduce greenhouse gas emissions; and
- Accelerate the research and development of advanced, clean energy technologies.”

The federal government supported this effort with \$610,000 and the expressed sense of optimism about the goals from Energy Secretary Samuel Bodman (NGA 2007). In addition, NGA leveraged this funding with private sector support. With resources- be they attention of officials, disseminatory materials, and straight financial resources- the network of governors leading the initiative were able to put the challenges and opportunities of state energy policy on the internal and national agendas.

As noted earlier, 2006 and 2007 were key years in the identification of climate and clean energy issues as a policy problem, the first step in establishing any effort within the policy process. The Stern Review, IPCC assessment report, and *An Inconvenient*

Truth brought attention into the consciousness. With a clear problem and interest in policy solutions, governors had the opportunity to open the Kingdonian policy window and set a policy agenda that addressed climate change and clean energy issues.

A bipartisan task force of governors guided the Securing a Clean Energy Future agenda. Kathleen Sebelius of Kansas joined Governor Pawlenty as a co-chair, with Jodi Rell of Connecticut, Charlie Crist of Florida, Linda Lingle of Hawaii, Brian Schweitzer of Montana, Ed Rendell of Pennsylvania, and Chris Gregoire of Washington as members. This was an experienced crew of governors, as all of the members except for Governor Crist served for more than one term and included 3 NGA chair people and one future cabinet secretary. Also of note is that all of the governors on the task force except for Governor Gregoire served at least part of their term in a state that went for a presidential candidate outside their own party. The impact of this leadership on the initiative, and within their own states indicates that this was a worthwhile investment of time and federal resources into state policy development.

The goals of the initiative are the first step towards understanding how NGA's efforts impacted state- as well as federal and local- climate and clean energy programs. Publications included "Greener Fuels, Green Vehicles: A State Resource Guide," and "Opportunities for States in Clean Energy, Research, Development & Demonstration." RD&D- research, development, and demonstration or development- was a driving theme of the efforts, including partnerships with state universities, the private sector and intergovernmental entities to achieve a greener, more secure energy future.

A press release from Governor Lingle's intergovernmental relations staff (Governor of Hawaii Washington Office 2008) highlighted her experiences as part of the

initiative. Relevant meetings included key private sector partners such as General Electric, Energy Department Officials including the Secretary of Energy and Assistant Secretary of Energy for Energy Efficiency and Renewable Energy, and opinion writers and leaders such as Thomas Friedman of *The New York Times*. Governor Lingle highlighted her state's "Energy for Tomorrow Initiative and the opportunity for leadership from Hawaii as a state that is heavily dependent on imported fossil fuels. While the press release was focused on Governor Lingle's accomplishments and what she was bringing to Washington for the energy policy dialogue, it is also clear that she had opportunities to learn and engage with governors and other key stakeholders. This type of political and private sector elite interaction can drive the agenda and help to diffuse policy innovations.

The governors who were members of the Securing a Clean Energy Future initiative had a significantly strong interest in placing these items on their state agenda in comparison to their colleagues. Table 10 is the result of an analysis by State of the State year for climate and clean energy topics appearing in these addresses with odds ratios for members of the initiative. These a governors were 3.84 times more likely to address these topics in all years under consideration- they were 5.71 times more likely to address this before the initiative and only 2.73 times more likely after NGA took this action. Their increased likely of writing these topics into this important annual speech remained when controlling for party. Thus, Securing a Clean Energy Future Members were ahead of the curve on these issues in choosing to devote their limited time and energy to the NGA effort and remained policy leaders and advocates going forward, but helped to

facilitate a greater interest in climate change, energy security, and related issues around the nation.

Table 10- References to Climate and Clean Energy Topics in State of the State Addresses for Members of the Securing a Clean Energy Future Initiative

Climate/Clean Energy Reference	Years	Observations	Odds Ratio
Securing a Clean Energy Future Members	2001-2012	536	3.84***
Securing a Clean Energy Future Members	2001-2006	279	5.71***
Securing a Clean Energy Future Members	2007-2012	257	2.73*
Securing a Clean Energy Future Members With Democratic Governor as Control	2001-2012	536	4.01***

Despite the increased incidence of the climate and clean energy policies on the policy agenda, there is not a verifiable correlation between the key actors or key program proposals and adoption of the public policies. The member governors tended to come from states with already existent innovative policies and the statistics do not show a clear diffusion pattern related to Governor Pawlenty's Chairman's initiative. The efforts of NGA reflected the increased awareness of state climate and clean energy leadership in this policy subsystem at this particular moment, publicized successes, and helped to facilitate an exchange of ideas and partnerships for a cleaner, more sustainable energy system. While it was not a policy punctuation, it was also not a failure, as it was a relatively small investment of resources in research, analysis, and dissemination of best practices that helped to expand awareness and capacity among key officials and support interested and engaged governors.

NGA has, in fact, maintained its attention towards clean energy and climate issues. When Governor Rendell became Chairman of NGA the following year, his focus

on infrastructure included “decreasing our reliance on imported oil,” “diversifying our nation’s electricity portfolio,” and “responding to climate change” through “sustainable” infrastructure development (Springer & Dierkers 2009). The NGA Center for Best Practices has continued to release reports on the development of green jobs and the clean energy workforce in response to ARRA and the economic development potential in these sectors during the Great Recession (Saha 2010). Despite the fact that it is no longer at the top of the chair’s agenda nationally, regional governors associations such as the Southern Governors Association (Center for Climate Strategies 2009) and Western Governors Association (2006), have formed committees and advisory groups or hired consultants to collaborate and publish reports on clean energy issues. As is typical at the national level, these reports from bipartisan groups of governors focus on the energy economic development nexus. The regional organizations can and do facilitate regional diffusion.

Governors at the national and regional level have also collaborated in new, specialized organizations outside of the established intergovernmental institutional structures on the relevant topics to this analysis. Nebraska Governor Ben Nelson facilitated the Governors’ Ethanol Coalition, now the Governors’ Biofuel Coalition (2013), back in 1991 to support the development and deployment of bio-based energy resources. While the current membership extends into every region of the country, all of the previous annual chairs are from the Midwest. Its accomplishments include pushing federal legislation on ethanol deployment and facilitating cross-state and cross-national partnerships. The Governors’ Wind Energy Coalition (2013) is newer and smaller- 22 current members compared to 38- but it also represents a bipartisan gubernatorial effort for renewable energy focusing on an exchange of ideas and lobbying in Washington.

Although they have different memberships, purposes, and leadership, the operations of the two organizations have the same staff. While both of these networks have improved information and agenda setting opportunities on non-partisan basis, neither program has directly established multi-state national programs.

Multi-state regional programs have not only altered the policy dialogue, but have created multi-state climate pacts with the force of law. The Regional Greenhouse Gas Initiative (RGGI 2013) is currently operational in Connecticut, Delaware, Main, Maryland, Massachusetts, New Hampshire, Rhode Island, and Vermont, having formerly also included New Jersey into the alliance. Bipartisan efforts aimed at energy policy in this region as run through the Coalition of Northeastern Governors (CONEG) predates the RGGI adoption and implementation. In a July 16, 2001 letter to President George W. Bush, Republican Governor of New York George Pataki and Democratic Governor of Vermont Howard Dean wrote (CONEG 2001):

The CONEG Governors believe that a comprehensive, balanced national energy policy should include a mix of public policy and market signals that will promote effective and competitive markets for reliable and reasonably priced energy for the nation's economy. Domestic energy production from diverse sources and an effective energy delivery infrastructure are essential for a reliable energy supply and conservation and energy efficiency are critical to a productive economy and environmental quality. The ongoing transformation in the nation's energy markets also requires a regulatory framework that encourages and fosters workable competition and interstate cooperation.

While much of the letter was in response to issues with deregulation and opportunities for federal-state collaboration, it also indicated the ongoing productive dialogue among northeastern governors that facilitated regional cooperation in the form of RGGI.

RGGI focuses on the power sector. Through model legislation in each of the participating jurisdictions, "States sell nearly all emission allowances through auctions

and invest proceeds in consumer benefits: energy efficiency, renewable energy, and other clean energy technologies.” (RGGI 2013) RGGI, Inc. is the organization that implements this effort through the platform for auctions and enforcement mechanisms. The authority to adopt and manage the program, however, rests with the individual states.

Discussion of RGGI appears in 9 State of the State Addresses in 7 RGGI states not including Connecticut and Maine, as well as New Jersey. Both Democratic and Republican governors express support for the program. This, however, is not a story of full cooperation. In 2011 Deval Patrick of Massachusetts mentioned that his Republican predecessor, Mitt Romney, refused to sign the state on to RGGI. Republican Governor Paul Carcieri expressed concern about how RGGI might impact energy prices in his state, but also celebrated his state’s decision to be a signatory to the program. Furthermore, while Republican Governor George Pataki was one of the founders of the program, New Jersey Governor Chris Christie pulled his state out of the program when the Governor’s Mansion in New Jersey shifted back to the Republican party. Thus, while there is bipartisan support in the Northeast and Mid-Atlantic for region, concern and dissent tends to be from the Republicans.

Other regions have attempted to follow suit. Governors from 6 states and one Canadian province signed the Midwest Greenhouse Gas Accord in 2007, with one signatory and two official observers from the Republican Party (C2ES 2013). There are not, however, relevant policies or platforms for mitigation among the Midwestern states. California, in fact, is the only state outside the northeast with an operational carbon cap and trade program in place. Thus, despite some anecdotal evidence, including Republican leadership from Tim Pawlenty, George Pataki, and Arnold Schwarzenegger

during times of high salience for these issues, it does not appear that there is a fully functional bipartisan coalition of governors across the country driving climate change policy. It has been, rather, regionally focused programs with some bipartisan cooperation that led the way. Beyond party and region, the next section will focus on personal factors that may have contributed to gubernatorial leadership in this policy subsystem.

Gubernatorial Ambition and Policy Making

The lack of federal leadership and comprehensive climate change legislation hindered the development and deployment of clean energy resources and carbon mitigation technologies and programs, as well as the associated benefits, but also provided a clear opportunity for state and local leaders to claim credit for legislative and regulatory action. Governors cited their own work as a model for a future polycentric approach to battle climate change and foster a secure, clean, domestic supply of energy. These models have provided the governors a platform to claim credit, show that they can lead, and urge federal action that supports their objectives. In the federalist system, this presented ambitious leaders an opportunity.

In a July 31, 2013 letter to President Obama, 10 Democratic Governors cited their own experience in RGGI and other programs in urging the federal executive to execute the proposed Climate Action Plan (Shumlin et al. 2013). It has not been, however, only the governors speaking for themselves. T. Boone Pickens, the energy resource wealth billionaire who lobbies aggressively with his vast fortune for cleaner fuel sources and a reduced dependence on foreign in the “Pickens Plan,” argues that governors have a better understanding of energy issues than the president (Davidson 2013). While governors in recent years have tried to stifle climate change efforts from the federal government within their states (Rainey 2013), it remain an area where states make clear progress against the disagreement and difficulty to push new policies through Congress in Washington. Governors seeking higher office can cite their successes in comparison to inaction at the national level, and came make a name for themselves in the national and international arena.

Despite the justification and evidence presented above about 2012 Republican presidential contenders discussing climate and clean energy policy, the statistical analysis shows a disconnect between the idea that the nationally ambitious had an opportunity in this area of public policy and the use of this political opening. The definition of high-level federal ambition for the purposes of this analysis is governors who ran for president or vice president, accepted a cabinet level appointment, or whom the *Washington Post's* The Fix political expert blog declares a potential 2016 presidential candidate (Cilliza, Blake, & Sullivan 2013a; 2013b). Nationally ambitious politicians include the high-level federally ambitious, as well as those governors who served as chair of the NGA, a stepping stone to the national stage. By these definitions 25 governors were federally ambitious with 34 governors possessing broader national ambitions for their agenda. One of the caveats to this definition is particularly prevalent with governors of California. Governor Schwarzenegger, for example, was not eligible to run for president due to the constitutional requirement of being a native born citizen while Governor Brown ran for president long before his current gubernatorial term and his high-level federal ambitions appear to have subsided after the 1970s.

Those governors seeking higher federal office after their term in the governors mansion did not put climate and clean energy issues onto the legislative agenda based on the analysis of State of the State Addresses. Table 11 shows that they were not statistically significantly more likely to discuss these topics, even controlling for political party. Thus, ambitious governor were not overt in their call to action on these issues across the country.

Table 11. Climate and Clean Energy References in State of the State Speeches

State of the State References	Odds Ratio
Federally Ambitious	1.136
State of the State References	Odds Ratio
Federally Ambitious	1.163
Democratic Governor	2.034***

* $p < 0.10$ ** $p < .05$, *** $p < .01$

Even if they were not explicit in their goals, it is also worth considering whether these governors used a quieter approach within their states to address this opening, perhaps to highlight future legislative successes in a national campaign. Table 12 shows the log-rank test for equality of survivor functions using an event history analysis for the state-years at risk of adopting the EERS or EERS goal policy to see if there is a difference in likelihood of adoption in states with federally or nationally ambitious governors. As this table makes clear, the events observed are not fundamentally different than the expected events based on the ratio of ambitious governors in the general gubernatorial population.

Table 12. Log-Rank Test for Equality of Survivor Functions for EERS or ERRS Goals in the States by Gubernatorial Ambition 2001-2012

EERS or EERS Goal	Observed	Expected
Federally Ambitious	26	25.6
Other Governors	7	7.4
EERS or EERS Goal	Observed	Expected
Nationally Ambitious	23	23.11
Other Governors	10	9.89

Table 13 shows that the lack of a statistically significant difference in likelihood of adoption of various climate and clean energy policy options increased with a federally ambitious governor. None of these policies fall into a 10% confidence level. These

include regulatory mechanisms and financing mechanisms. A cap and trade program is nearly statistically significant even with the governor of California counting among those governors who were not ambitious due to his constitutional status as a foreign born citizen, but this relationship is spurious with the regional nature of these programs. Furthermore, building code establishment and adoption for any code- not necessarily to the ARRA standard- is also more nearly statistically significant but this relationship is not necessarily a direct result of gubernatorial intervention. Table 14 further shows, as an example, that a multivariate event history analysis controlling for party still results in a lack of significance for the federally ambitious variable. This is true across the suite of policy options for climate and clean energy.

Table 13. Log-Rank Test of Equality of Survivor Functions Chi-Squared Statistic for the Dichotomous Variable Federally Ambitious for Climate and Clean Energy Policy Adoptions

Federally Ambitious	Pr>chi2	State Adoptions
EERS or EERS Goal	0.855	33
EERS Regulation	0.996	24
RPS or RPS Goal	0.336	38
Cap And Trade	0.188	11
Climate Action Plan	0.511	36
PACE Enabled	0.490	27
Commercial Code	0.137	40
Residential Energy Code	0.146	40

Table 14. Odds Ratio for Event History Regression Analysis for Likelihood to Adopt EERS or EERS Goals

EERS or Goal	Odds Ratio
Democratic Governor	0.726**
Federally Ambitious	0.005

*p<0.10 ** p<.05, *** p<.01

Although it is clear that some of the most presidentially ambitious governors became involved in clean energy and climate issues, including direct challenges to the federal government, the statistics do not bear out a strongly significant relationship between ambition and politics in this instance. Minnesota and Massachusetts, in particular, are Blue States where attention to environmental issues are part of the culture. Climate change was not a favorable issue for all governors seeking an elected or appointed federal executive office.

Legislative Federalism: Political Competition and Energy

Although many governors- particularly well-known governors, including Democrats and Republicans- played a major role in putting climate and clean energy issues on the agenda within their states, through their networks and at the federal level, there was not a significant bipartisan network of entrepreneurial governors in climate and clean energy policy in the states from 2001-2012. Considering the role of a governor in Figure 9, there certainly was agenda setting in many State of the State Addresses. There also was networking and leadership through action at the state level among many governors. There was not, however, a connection between ambition and entrepreneurship for governors as a driving force in policy adoption. In addition, political party was a significant determinant towards action to mitigate greenhouse gas emissions and although there are exceptions, Democrats were clearly more invested in this policy subsystem than Republicans. The laboratories of opposition were most experimental when Democratic leaders opposed a Republican president in pressing for climate and clean energy innovations.

An opening for political opportunists in governors' mansions went unfilled. Through Securing a Clean Energy Future, governors became knowledgeable of the best practices for innovations within their states. Their appeals also indicate vertical competition in the federalist system in recognizing the holes present in the national policy environment in this subsystem and the opportunity to address this global concern with actions within and among states. RGGI, for example, provides a model for cooperation among horizontal interests that could pressure the politics of the vertical intergovernmental system in this domain. Despite the missed political implications for

ambitious governors, states did compete with one another and find ways to challenge the status quo. The next section shifts from the horizontal and vertical political cooperation and competition to the horizontal competition of these rational actors to develop new resources and clean energy industries, in part fueled through the vertical resources of the Recovery Act.

CHAPTER 6

THE STATE ENERGY PROGRAM AND THE RECOVERY ACT

As a vertical dispersion of resources, the \$3.1 billion dollars allocated to the State Energy Program through the Recovery Act offered the 50 states- as well as the District of Columbia and 5 territories (but this research does not include those six jurisdictions due to their size and unique features compared to the 50 states)- an opportunity to contribute to financial recovery through new or vastly expanded clean energy programs. As noted earlier, the American Recovery and Reinvestment Act of 2009 was one of the most significant pieces of energy legislation to ever make its way through the United States Congress. These federal resources helped to standardize energy policies through intergovernmental fiscal suasion and provided critical resources to laggard states. The Recovery Act is a useful window into the policy choices of state governments in the competitive federalist framework, as they sought to enhance their economy and energy programs with new resources. While the next section will explore the shift in the policy discourse towards climate and energy policy as economic development, this section will address the hypothesis that the State Energy Program Recovery Act resources reduced the policy adoption gap between early enactors and laggards in clean energy financing and regulation.

The Vertical Federalism of the Recovery Act

The Recovery Act altered the relationship of the US Department of Energy with the State Energy Offices. DOE and the SEOs have engaged one another through intergovernmental activities throughout the entire history of DOE and the SEOs. SEP was most recently reauthorized in EISA 2007, with an Oak Ridge National Laboratory report (Schweitzer et al., 2003) showing significant economic and environmental benefits from investments in these leveraged activities. It was also clear, however, that there was more potential- that there were more “shovel ready” projects- that the states could implement with more funding. The SEOs lobbied heavily for additional SEP funds as the Obama Administration and Congress discussed its response to the economic crisis. It would result in an historic investment in SEP, as well as a variety of other state and local programs. SEP would grow in stature and attention from the governors, but there were restrictions and changes, as well as responsibilities, that came with this resource windfall.

In a letter to Secretary of Energy Steven Chu dated February 24, 2009, Kansas Governor Kathleen Sebelius wrote:

Dear Secretary Chu:

As a condition of Kansas receiving its share of the \$3.1 billion funding for the State Energy Program under the American Recovery and Renewal [*sic*] Act of 2009 (H.R. 1)(ARRA), I am providing the following assurances:

I have written to our public utility commission and requested they consider additional actions to promote energy efficiency, consistent with federal statutory language contained in H.R. 1 and their obligations to maintain just and reasonable rate, while protecting the public.

I have also written to the state legislature and requested that they consider actions to improve building energy codes and to consider the statutory language contained in ARRA.

We are prioritizing our energy investments to take advantage of existing programs and expand programs where appropriate. We are committed to advancing energy efficiency programs and renewable energy, as well as a balanced state energy policy. I want to assure you that we will move forward in

these critical areas. We look forward to immediate distribution of the federal SEP funds which will allow Kansas to make progress in these critical areas.

Most states submitted the exact same language- including errantly replacing “Renewal” for “Reinvestment” for the name of ARRA- based on a template NASEO developed. Included in the package of assurance files obtained through a FOIA were often letters from the governors to the public service commission, legislature or housing authority, and state energy office highlighting the statutory requirements on utility regulation, codes, and prioritization respectively. Making the statement of these three assurances was the minimum requirement to apply for the SEP formula funding.

The carrot of the funding was enough to get 49 of the state governors to agree to consideration of federalization of building codes and utility rate structuring. In accepting the funding each year states had agreed to the limitations on the funding outlined in the Code of Federal Regulations (10 CFR 420), including cost-sharing, development of a state energy plan, and various energy provisions such as allowing right turns on a red light where it is safe to reduce gasoline consumption. While ARRA removed the cost share requirement, governors expressed concern about onerous burdens that came with the windfall. In accepting the money, Governor Perry of Texas wrote:

I must express concern, however, that your agency puts the state in a precarious position by announcing that it will publish additional rules on permissible uses of the money after a state accepts the money. [...] Imposing unnecessary restrictions on the development of our domestic energy resources and implementing draconian carbon regulations and new taxes on our energy supply at a time when American families and businesses are struggling to make ends meet will only prolong the nation’s recession and irreparably damage America’s competitiveness.

Only Governor Palin, however refused to accept the money due to the building code requirements (Galbraith 2009b), and with her resignation and the approval of the Alaska

legislature, every state joined the SEP formula under the ARRA restrictions, whether early or late to the game.

Several governors used the letters to tout their states' progress on utility incentives and building codes. Governor Deval Patrick of Massachusetts noted his state already implemented decoupling, while the governors of New York, New Mexico, and Texas argued that their states were already in compliance in encouraging energy efficiency and maintain stable rates even without a full or formal decoupling mechanism. After the letters, states submitted details of their assurance activities that detailed their progress towards energy efficiency and renewable energy goals. Oklahoma, for example, noted meetings and support to encourage building code adoption.

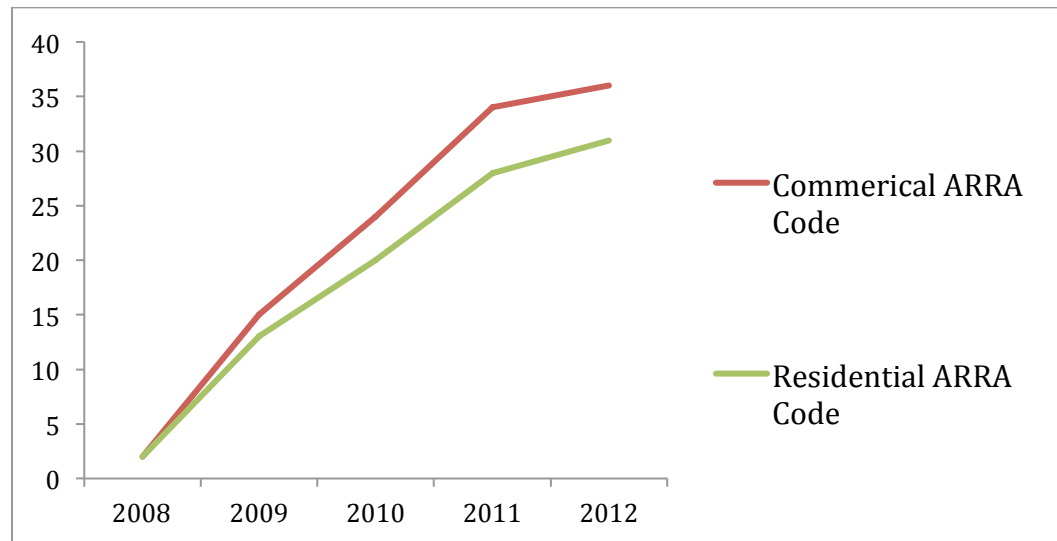
The idea of the Recovery Act SEP programs was that they would support states in climate and clean energy policy and serve as a first step towards a greater greenhouse gas mitigation effort (Grunwald 2012). Through this mechanism, the intention was to get more states to adopt enhanced building codes and eventually achieve 90 percent compliance among the other goals. In understanding the building codes requirement, the analysis can glean a better understanding of state behavior as related to this vertical fiscal federalism. It is worth reiterating that the only mandatory action for this funding was the letters and that funding is not contingent on further compliance even as those letters are a matter of the public record.

Nationalizing the building code, or at least attempting to do so, was not the only federal foray into standardization of energy programs through Recovery Act funding. Much of the activity ran through the Department of Energy for coordination. The Weatherization Assistance Program (WAP), which received \$5 billion in ARRA

resources, provides home energy improvement services to low-income Americans through the states, but it follows national procedures and requirements for implementation. States, however, had broad authorities to design their own appliance rebate programs and EECBG to their own specifications within the program guidance. SEP was the largest of the flexible programs, but also one of the only activities funded through ARRA in a policy area with specific statutory requirements for that provision on the state level. The federal government wanted to put resources into depleted state coffers without political confrontation, administrative hurdles, or other hassles and thus, decided to limit its intergovernmental requirements to program activities, adherence to wage and environmental law, and these letters. The question at hand is what sort of impact the agreement of the governors as stated in the letters had on actual adopted policies. The expansion of building codes requirements is a window into these results.

Figure 11 shows the adoption of ARRA level building codes. For the commercial sector this is a code that meets or exceeds American National Standards Institute/ASHRAE/ Illuminating Engineering Society of North America (ANSI/ASHRAE/IES) Standard 90.1-2007 and for the residential code it must meet or exceed the 2009 International Energy Conservation Code (2009). In addition, ARRA calls for 90 percent compliance by 2017, but it is too early to evaluate the implementation targets. States generally review codes on a 3 year cycle after the standards setting body determines the new code requirements, so there is a lag in the adoption of advanced codes. By the end of 2012, code adoption had leveled off with 36 states at the commercial ARRA level and 31 states at the residential ARRA level.

Figure 11. State Adoption of Commercial ANSI/ASHRAE/IES Standard 90.1-2007 and Residential 2009 IECC Building Energy Codes



While Figure 11 does not show causality from ARRA, Figures 12 and 13 respectively show that new states have adopted energy codes for commercial and residential structures that previously did not have a statewide energy code on the books. While there were not any new statewide code adoptions from 2004-2008, 4 new states in the commercial sector and 5 new states in the residential sector developed, legitimated, and began the process of implementation for regulations on building efficiency. These codes are not necessarily up to ARRA standards, but the new emphasis on code development in ARRA has further driven this topic on the state agenda as part of state energy plans.

Figure 12- Status of States without a Statewide Commercial Building Energy Code in 2008 as of the end of 2012.

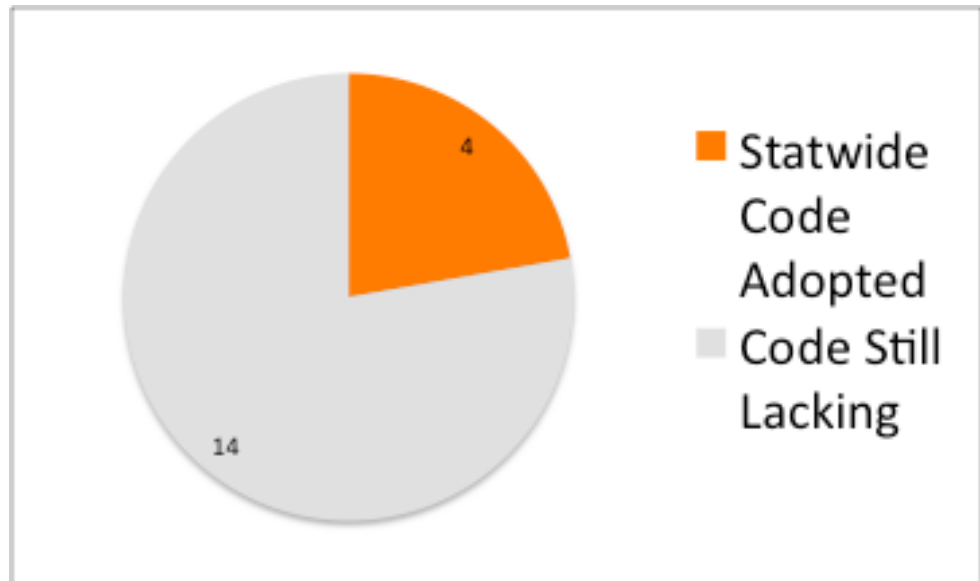
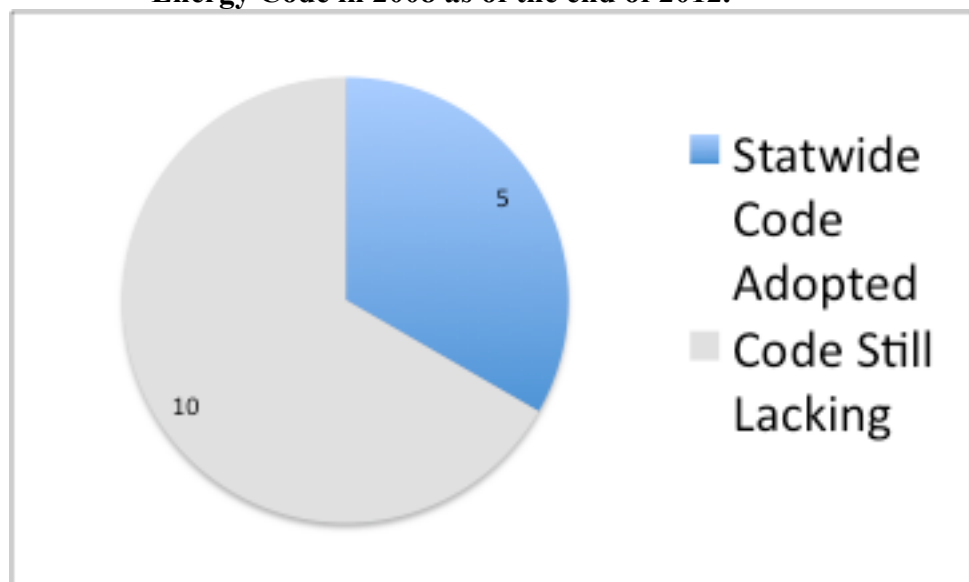


Figure 13- Status of States without a Statewide Residential Building Energy Code in 2008 as of the end of 2012.



One of the longest lasting legacies of the Recovery Act will be the attention given to building codes to achieve energy savings that can benefit the environment and the economy. While the law did not specifically force a national building code, it has encouraged state-level progress on this issue. States have advanced their regulations and

used ARRA resources to implement an effort for increased compliance. While ARRA had a sunset period, energy saving from building codes can last as long as the structures themselves. Building codes, while a notably legacy and one with important intergovernmental implications, were not the only impact of ARRA on clean energy deployment and the use of climate change policy to encourage economic growth.

Event history analysis provides further determinants of building code policies. Table 15 shows a relatively even distribution of the adoption of ARRA-level building codes by census region. The Northeast has the highest percentage of adopters with the South at the lowest level by percentage as the region with the most states. It is worth noting that all residential code adopters also had the commercial building code, although five more states adopted the commercial code. The last column indicates the number of states that have adopted both code, which is equal to the residential code adoptions. Table 16 shows the log-rank test of equality of survivor functions and although the Northeast far exceeds its expectations for adoption of the full ARRA code and the South does not achieve the expected level of the function, there is not a statistically significant relationship between ARRA code adoption and region.

Table 15- Adoption of ARRA level building codes by Census Region

Census Region	Numbers of States	Residential ARRA Code	Commercial ARRA Code	Full ARRA Code (Both Sectors)
Northeast	9	7	8	7
Midwest	12	8	8	8
South	16	8	10	8
West	13	8	10	8
Total	50	31	36	31

Table 16- Log-rank Test for Equality of Survivor Functions for Adoption of the Full ARRA level building codes by Region for 2008-2012

Census Region	Full ARRA Code (Both Sectors)	Expected Events
Northeast	7	3.95
Midwest	8	7.48
South	8	10.64
West	8	8.93
Total	31	31
Chi2 (3)	3.93	
Pr>chi2	0.2693	

Politics, particularly political culture, played a role in building code adoption. While there was not a significant relationship to the governors' political party, there was a very significant relationship for the Blue State variable holding gubernatorial party constant, with Blue States more than five times as likely to adopt the code as indicated in Table 17. This is based on 537 observations, as the state exits the data set upon adoption of the code under the method of event history analysis. It is not surprising that the political culture of the state as measured by presidential vote is more important than the party as Blue States tend to be more in favor of proposals of the Obama Administration and the governor often does not exercise major authority in code adoption, as legislatures and housing authorities play a key role. With the reservations of the Republican

governors, however, it is an interesting result and shows the implications of national politics on nationalization of state efforts.

Table 17- Event History Analysis of ARRA level code adoption for 2001-2012

Exponential regression -- log relative-hazard form				
No. of subjects =	50	Number of obs =	537	
No. of failures =	31			
Time at risk =	537			
Log likelihood = -82.691079		LR chi2(2) =	18.42	
		Prob > chi2 =	0.0001	

_t	Haz. Ratio	Std. Err.	z	P> z
-----+-----				
BlueState	5.12	2.23	3.76	0.000
DemocraticGov	1.11	0.40	0.27	0.783
_cons	0.02	0.00	-9.52	0.000

The building code provision is one area where ARRA pushed laggard states in climate and clean energy policy. In addition to promoting decoupling- a policy mechanism that though it had been around for decades only existed in 17 states as of June 2009 (NREL 2009)- in the letters, the funding could support new investments. As shown in Figure 14, ARRA not only expanded SEP, it dwarfed previous appropriations and even the authorized amount for SEP that it never reached in the annual discretionary spending process from EISA 2007. In addition to SEP, states received a portion of EECBG resources that did not go directly to cities or tribes, WAP resources, Energy Star appliance rebate funding and aid for low-income families on utility bills through ARRA. It is, however, SEP where the states had the new resources, state energy office control, and state level flexibility to help laggards to catch up to leaders in climate and clean energy policy efforts through models of policy innovation.

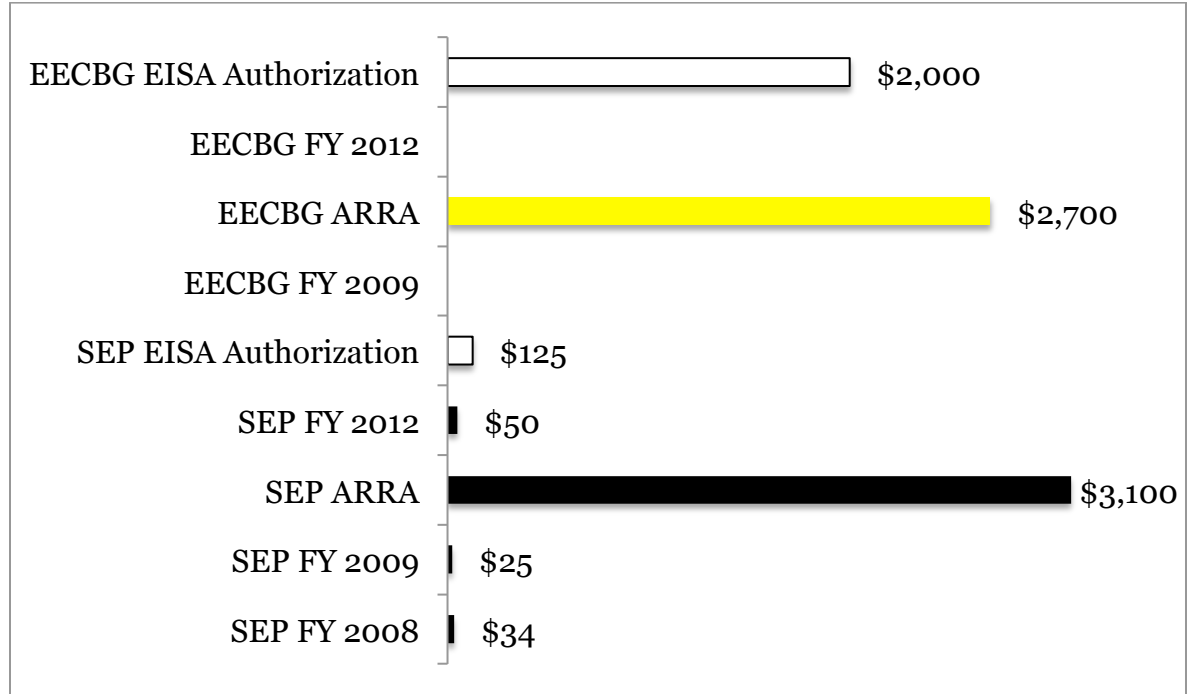


Figure 14- Authorizations, Appropriations, and ARRA Funding for SEP and EECBG Formula Grants to Cities, States and Tribes in Millions of Dollars

The next section will establish the adoption gap. An assessment of whether ARRA helped close this gap and push laggards up to leadership based on models of policy innovation will follow through funding and regulation. ARRA was a major moment for state energy policy in the conventional wisdom and this analysis will show its impacts across the nation, particularly related to core SEP activities.

The Adoption Gap and State Plans

The leader-laggard model of policy diffusion, as advanced in Berry and Berry (2007), implies there is a noticeable gap between states that have pushed innovation and states that follow these models of innovation. While the literature review notes numerous examples of state ratings in climate and clean energy (such as Rabe 2008) this analysis will establish a new index to identify leaders and laggards. It will then explore how the Recovery Act may have influenced the expansion and adoption of new programs for the laggard states to innovate and close the adoption gap.

As noted in the introduction for the purpose of this analysis, leadership is a level of adoption and investment in relevant policy innovations that is beyond the policy environment of other jurisdictions- states or the federal government- at the time of enactment and offers a policy model for receptive innovators. Any effort to develop criteria for who is a leader and who is a laggard requires subjectivity of the researcher in assigning the policies for consideration. The leader and laggard division identified here is based on a score for dichotomous variables outlined below that represent successful practices in the deployment of energy efficiency and renewable energy projects that overcome regulatory and financing barriers, as well as climate change mitigation strategies.

As this research centers around ARRA SEP, the policies under consideration for identifying leaders and laggards is based on the areas that ARRA SEP address. Energy efficiency is more heavily weighted as a far greater proportion of state ARRA funds went towards energy efficiency projects (Goldman et al. 2011). Thus, the metrics include whether or not the state has an above average score in the comprehensive ACEEE

rankings and whether the state's per capita energy efficiency budget is above average. In addition, while investment is important, it requires regulatory mechanisms to encourage clean energy and thus, the ratings will include the adoption or lack thereof for EERS and RPS. Finally, on the climate action front, the analysis will score whether or not a state has a climate action plan. While a climate action plan does not have the enforcement of a cap-and-trade system for greenhouse gases, it is the first step towards addressing that issue, while a price on carbon is a more rigorous approach to pollution prevention. Table 18 summarizes the key data that this research evaluated for 2008 (before the Recovery Act) and 2012 (after the ARRA period) to evaluate the shifts. The scores do not include the direct ARRA requirements on codes and decoupling, but those will receive further consideration in the forthcoming analysis.

Table 18- Policies for Identifying Leaders and Laggards

Policy	Credit for Policy Requires:	Sources
EERS	Policy adopted (not just goal)	DSIRE
Energy Efficiency Budget	Above average per capita	CEE
ACEEE Scorecard	Above average	ACEEE
RPS	Policy adopted (not just goal)	DSIRE
Renewable deployment	Above average per capita	EIA
Climate Action Plan	Plan in place	C2ES
Price on Carbon	RGGI or CA AB 32	C2ES

This set of policies is not a perfect representation of clean energy policy in the states, but these are useful metrics for summarizing the experience of states with regards to key measures for addressing climate change and energy security. The focus on energy efficiency shows where states have found agreement to pursue this resource in the legislative, executive, and utility commission sectors of governance and achieved higher levels of investment and outside recognition. While there is no clear scorecard for

renewable energy, and RPS is a key state policy and renewable deployment shows a degree of support from within the state. The Climate Action Plan is a minimal acknowledgement of the challenges of greenhouse gas mitigation efforts, but it is a first step towards state action in this area. While a cap-and-trade program is a more rigorous activity in this area, with only one state having its own internal program, it is yet to be a program idea that states act to legitimate and implement without a regional effort. One final limitation is based on the fact that it is comparative and not normative or aspirational, the evaluation is based on the means and not the ideals of policy for the states in question.

In 2008 there were 20 states that had 4 or more credits for the policies in table 12. This number rose to 23 in 2013 with new, non-directly ARRA influenced changes in Arkansas, Colorado, and New Hampshire flipping those states from laggards to leaders. Table 18 lists the states with non-directly ARRA related scores of 4 or more that led the way in the climate and energy policy arena in this time period. It is worth noting that the regional distribution shows a heavy concentration of states in the Northeast- the home of RGGI, and West- the home of vast solar, wind, woods, and hydroelectric renewable resources, dominating the rankings, while Southern States lag behind. In fact, only a third of states that use coal as their primary fuel are leaders (10/30) while over half the states that use natural gas (6/11) and 7 of the 9 states that have nuclear hydroelectric, or oil as their primary fuel are in a leadership position. Geography's role in how states approach clean energy, as every state along the ocean coast except for those directly to the south of Washington, DC is a leader based on these criteria in climate and energy efforts.

Table 19- Leader States Based on Credit from Table 18 for 2008 and 2012 (*= Did not Qualify in 2008 but did Qualify in 2012)

Arizona	Iowa	New Mexico
Arkansas*	Maine	New York
California	Maryland	Oregon
Colorado*	Massachusetts	Pennsylvania
Connecticut	Minnesota	Rhode Island
Delaware	Nevada	Vermont
Hawaii	New Hampshire*	Washington
Illinois	New Jersey	

Beyond geography, politics also plays an important role in leadership. States with Democratic governors and who support Democratic candidates for president show a statistically significant level of increased leadership in this field. Table 14 shows the differences between the parties for the dependent variable of leadership based on a logistical regression of political party based dependent variables. This is not a surprising result, but it can help to inform the 3 states that flipped to leaders from laggards between 2008 and 2013. The governors' mansions in Arkansas and Colorado went from Republican to Democrat in 2007, while the Democrats took this power in 2005 in New Hampshire. While this means Democrats were in charge in these states in 2008, there was a lag time to put these policies into place by 2012. Beyond this simple statistical fact, however, the analysis will look further into these flipped states' experiences through their plans and actions.

Table 20- Logistic Regression for Leadership Level in 2012 by Political Party

Binomial Logistic Regression	
Psuedo R2= 0.349	Odds Ratio of Leadership
Blue State	30.00***
Binomial Logistic Regression	
Psuedo R2= 0.170	Odds Ratio of Leadership
Democratic Governor	8.25***
Multivariate Logistic Regression	
Psuedo R2= 0.446	Odds Ratio of Leadership
Blue State	29.91***
Democratic Governor	8.21**

*p<0.10 ** p<.05, *** p<.01

Arkansas becoming a leader is perhaps the least likely as the state has readily supported the Republican candidates for president after the terms of its native son Bill Clinton, bucking the trend of Blue State and bicoastal leadership. Arkansas's SEP plan, however, illuminates the states' strategy on the deployment of climate and clean energy policies and technologies. In particular, Arkansas focused on "stealth" strategies and support for business and industry in its programming. The state serves as a model of economic development justifications for clean energy investments.

Arkansas paid close attention to local resources and interests. In its description of its \$1.6 million for the Advanced Lighting Technology for Poultry Growers the Arkansas Energy Office wrote, "Arkansas has a significantly large poultry industry. Many growers have been financially stressed as energy prices have increased." Working with the University of Arkansas's Center of Excellence for Poultry Science the ARRA funding in this project went to LED lighting systems for this form of agriculture. The state estimated that the program would create 17 jobs (about \$95,000 per job) and result in 300,000 MBtus of annual energy savings. The poultry project was not the only effort that

Arkansas directed at industry and agriculture, as the state devoted \$11 million to these sectors, much of it in cooperation with local universities including through the Arkansas Industry Clearinghouse.

Beyond universities, the State of Arkansas also partnered with the Clinton Climate Initiative on the Employer Assisted Home Energy Assistance Loan (HEAL) Program. In the project overview the state energy office notes that this is an adaptation of a model of innovation as it “will be further modeled after the NOLA 100 rapid rebuilding response in New Orleans supported by the Clinton Climate Initiative in response to Hurricane Katrina.” HEAL is a pilot innovative financing mechanism that aimed to retrofit 200 residential buildings, 3 industrial facilities, and a commercial building through business-backed low or zero interest loans. Not only does HEAL diffuse and adapt an established model for the financing and deployment of energy efficiency, but it is a sustainable mechanism for continued disbursement of funds without continued windfall federal appropriations that will help Arkansas to remain in its new leadership position beyond the Recovery Act period.

Arkansas also devoted just under half of its Recovery Act SEP funding to renewable and other supply side energy resources. In fact, \$750,000 went towards a solar-based Emergency Renewable Energy Power Project. Creating 8 jobs and working with the Arkansas Department of Emergency Management, this project justifies its allocation as a response mechanism to many of the recent disasters to afflict the state. As with the whole of the Arkansas effort, this stealth strategy will help this new leader to realize significant greenhouse gas mitigation, even as it focuses on other issues. From

emergency management to the poultry industry Arkansas is attacking climate change without explicitly attacking climate change.

Unlike Arkansas, Colorado was a new leader from 2008 to 2012 that took a direct, “prime-time” approach to climate issues and the environmental benefits of clean energy in its ARRA SEP plans. The state lists its rigorous list of goals and includes the statement, “Governor Ritter’s Climate Action Plan is a call to reduce emissions of greenhouse gases by 20 percent over 2005 levels by 2020, and makes a shared commitment with other states and nations to even deeper emissions cuts by 2050.” Building off of these ideas, the plan puts resources towards strategies that provide access to services, access to capital, and access to distribution. The State of Colorado is pushing a clear leadership agenda and fits the Recovery Act investments into achieving a clean energy future in its state and beyond. While there are co-benefits to these programs, particularly meeting ARRA’s economic development purposes and requirements, there is also energy efficiency and renewable energy programs for the sake of the development of climate strategies and alternative energy sources.

The final recent laggard to leader was New Hampshire, which had the smallest of the three ARRA awards due the formula’s basis in population and energy usage. Despite the smaller budget, New Hampshire initiated a diverse portfolio of projects to meet the multiple goals of energy policy. Many of New Hampshire’s programs were expansions of efforts currently underway. These included expanded programs for business efficiency, residential efficiency, and renewable energy, building on existing structures to produce continued results with improved expected metrics. Additionally, New Hampshire’s plan has the aim of growing its lead by example efforts with an expanded

clean energy procurement program for the state. New Hampshire not only clearly served the gubernatorial assurance of enhancing existing efforts, but also devoted about \$675,000 towards building code efforts.

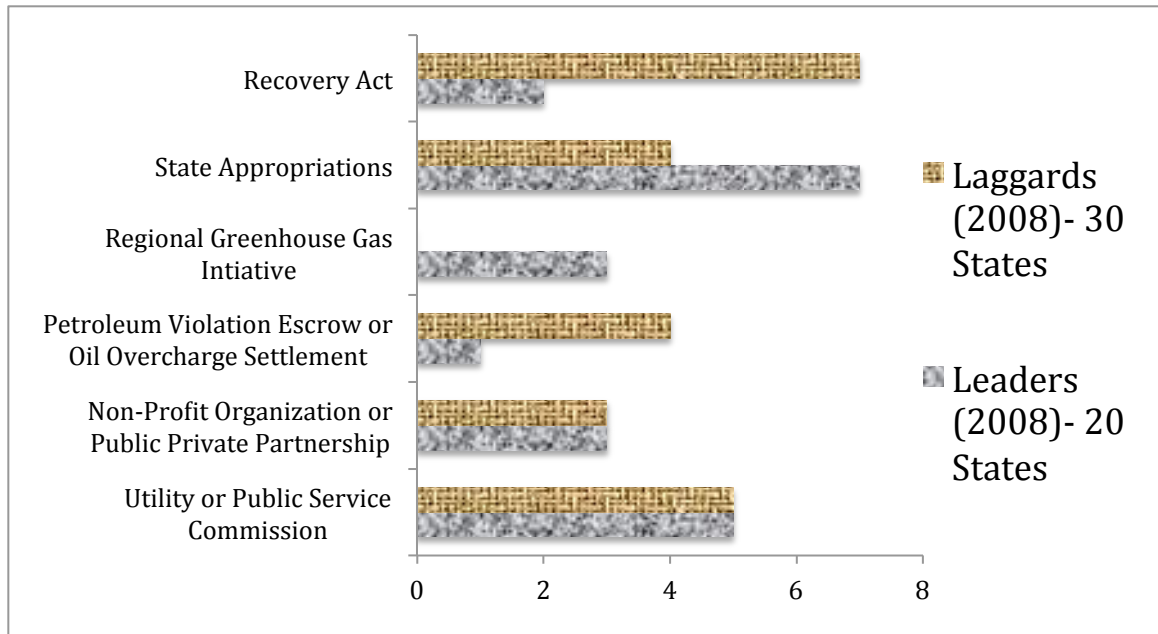
New Hampshire, however, also sought innovation beyond the core Recovery Act expectations. The plans note that the state will leverage new funds from EECBG, RGGI, and the state's RPS to continue its push towards a clean energy future. It's Innovative Initiatives program put over \$1.5 million towards an RFP "from the public and private sectors [...] focus[ed] on providing funding not otherwise available for projects with high market transformation." New Hampshire sought good ideas beyond those internal to the state energy office. Finally, some of its funding went into a financially sustainable revolving loan fund.

Revolving loan funds have a long history of success. Deitchman, Brown and Wang (2012) write:

Revolving loan funds provide the upfront costs to commercial sector entities to pay for energy-efficiency retrofits and then utilize the repayments through energy savings to continue the financing in perpetuity. The National Association of State Energy Officials (NASEO) database shows that states operate over \$925 million in revolving loan funds for all sectors. While some of these programs are new, others have existed since the 1970s. The LoanSTAR program in Texas, for example, has made loans for over two decades, financing 202 projects, none of which have defaulted [...]. This mechanism has a history of success and facilitates long-term growth in energy efficiency through the provision of sustainable, upfront capital.

The firm of Lathan & Watkins LLP (Gergen, Cannon Jr., & Binnings 2010) provides a useful- albeit non-comprehensive- collection of incentives for energy efficiency and renewable energy generation through revolving loan programs that are private sector investment focused. Based on this document, 7 of the 11 revolving loan funds supported

by state appropriations are in leader states while 7 of the 9 states that used ARRA SEP funds for Revolving Loan Funds were laggard states. Other sources of revolving loan funds are utilities, oil overcharge funds, and public private partnerships, as outlined in the figure below. This ongoing recycling of the federal investments could help to continue to close the gap without intensive ongoing investment after the ARRA period.



Total State With Funds= 8 Leaders and 16 Laggards

Figure 15. Number of Private Sector Supporting Revolving Loan Funds by Source of Seed Funding

Based on data from Gergen, Cannon Jr., & Binnings (2010)

Table 21- Self Identified Innovations in ARRA SEP Plans
(Laggard States in Italics, *= Laggard in 2008 but Leader in 2012)

Programmatic		Technological
Innovative Financing	Innovative Program Design	Innovative Technology
MN	AR*	<i>AK</i>
<i>NC</i>	CA	DE
<i>TN</i>	CO*	<i>ID</i>
	HI	<i>MI</i>
	IA	NJ
	<i>KY</i>	<i>UT</i>
	MD	<i>WI</i>
	ME	
	<i>MS</i>	
	NH*	
	<i>OH</i>	
	OR	
	PA	
	WA	

Innovations in financing are a mechanism for states to sustain temporary financing resources. Three states- Minnesota, North Carolina, and Tennessee- self identified innovations in clean energy financing in their ARRA SEP documents. Both Minnesota and North Carolina stated plans to help homeowners make energy efficient investments through loan products. As North Carolina wrote, “Such financing is currently unavailable to most homeowners through traditional lending programs, and this prevents homeowners from pursuing more costly energy improvements or renewable energy systems.” Working with private sector partners, these states developed programs to leverage resources beyond the direct use of Recovery Act funds to assist this market. Tennessee, on the other hand, devoted all of its SEP allocation to solar energy technologies and economic development in the state through this form of clean energy. The Volunteer State included plans to continue its “innovative” green tax breaks started

in 2008 to encourage the development of solar companies with local operations.

Financing was not the only place where states self-identified innovations, as highlighted in Table 18 above.

Although the focus of this analysis is policy, it is noteworthy that 7 states, 5 of which are laggards in this policy area, invested in innovative technologies with the potential risks of newer, less proven, energy efficiency and renewable energy systems. Programmatically, 14 states, the majority of whom were already leaders, sought to bring innovative programs to the fore. Iowa, for example, sought innovative ideas from applicants across the state in a similar manner to New Hampshire. Maine sought to replicate existing innovations, explicitly following the time tested models of diffusion. Hawaii, however, best illustrates how a leader could continue to push forward. Instead of simply looking within the border of the United States, Hawaii's innovation models the Better Place program in Israel that aims to revolutionize the recharging of batteries in electric vehicles through a replacement system. Thus, while Hawaii needed to act quickly in its plans, even as a leader, it was able to find a further model of innovation and stay well ahead of laggards. Laggards certainly had more models of innovation, but leading states found programs that could push the boundaries of leadership even further.

Not all forms of innovation require self-identification. In the clean energy financing space, Deitchman, Brown, and Wang (2012) conducted a literature review and spoke with experts to determine means that states and localities could support energy efficiency efforts through flexible innovative means with limited seed funding and highly-leverage private-sector support. These flexible innovations in financing included the previously mentioned revolving loan funds as well as loan loss reserves, tax-lien

financing (such as Property Assessed Clean Energy financing- PACE programs), performance contracts, and on-bill financing. For a loan loss reserve, “State and local governments can work with banks to create a loan loss reserve (LLR) fund. Such funds protect financial institutions, as they cover the risk of potential losses through default. An LLR operates through a third-party and does not require a guarantor.” (Deitchman, Brown & Wang 2012). Just two states, Vermont and Washington, invested ARRA SEP funding into LLR mechanisms. Vermont invested \$1 million to encourage loans of 10 times the value of the LLR while Washington allocated up to \$5 million for similar purposes in clean energy deployment.

In addition, 6 states (Colorado, Louisiana, Mississippi, North Carolina, New Mexico and Oregon) discussed energy savings performance contracting (ESPCs) in their SEP plans, many building on their history of using pay-for-performance partnerships with the energy services industry. Political leaders and citizen watchdog groups have apprehensions about energy efficiency contracts that attempt to bypass the budget process in using the future energy savings to pay for the upgrades, whether or not the intentions are legitimate. Officials lost trust in ESCOs’ ability to deliver on their energy and economic promises in light of the Enron scandal last decade. Enron Energy Services, along with the other divisions of the ill-fated company, cost the government- as well as private businesses- through its failure to actually act and achieve its promises (Rahim, 2009). Despite the challenges, however, states are using Energy Savings Performance Contracts (ESPCs) to reduce energy consumption in offices, schools, prisons and other civic infrastructure. The Kansas Facility Conservation Improvement Program, for example, has made over \$130 million in energy efficiency improvements through ESPCs,

saving \$11 million per year in energy expenditures while reducing the state's carbon footprint (NASEO 2008). Through the use of ESPCs in the states, governments are taking greenhouse gas mitigating actions with only a small impact on their stretched budgets and minimal risk. This is because under the ESPC agreement, the ESCO guarantees the savings and provides financing, with the company accruing some of the measured and verified financial savings over the life of the project (Zobler & Hatcher, 2003). The ESCO industry reports that \$10 million in ESPCs can result in 95 verifiable jobs (NAESCO 2008).

With all of the benefits of ESPCs and the minimal upfront costs, six states appears to be a small number of states using this method of innovative financing to improve the efficiency of the building stock. Part of the history is that many states, both leaders and laggards, already had evolved ESPC programs by 2009. On the other hand, states also found means outside of SEP to expand ESPC programs. Georgia, for example, was only able to begin to implement multi-year ESPC agreements after voters approved Amendment 4 to the State Constitution in 2010 specifically targeting this industry and the energy efficiency market. While the state's SEP plan did not devote attention to this mechanism, the state energy office has continued to push for an expansion of performance contracting and worked with cities and counties such as Atlanta and Savannah to expand opportunities for local partnerships with ESCOs to enhance energy efficiency (Deitchman 2011). This is a further reminder that while \$3.1 billion was a major change to SEP, it was only a dent in the entire state-level clean energy market and programs like performance contracting could evolve and expand without direct funding.

One of the benefits of innovative financing is, in fact, that it can grow without direct taxpayer resources. Goldman et al. (2011) show that, for example, ARRA programs leverage and provided synergy with utility efforts. While none of the plans called for on-bill financing, co-sponsored innovations and ongoing coordination opportunities between the public and private sectors arose beyond the simple planning for the distribution of the \$3.1 billion states added to their coffers for energy programs.

PACE financing was another area did not get a specific mention in ARRA SEP plans, but as Figure 16 shows, it expanded rapidly during this period, from only one state with preexisting authority (Hawaii) to 27 states at the end of 2012. Deitchman, Brown, and Wang (2012) define PACE:

Tax lien financing through PACE taxation districts allows property owners to finance energy-related upgrades through debt assessed to real estate. This debt is repaid through the property taxes collected by municipal governments. PACE financing operates through municipal bond sales, the proceeds of which go to finance energy upgrades.

It is worth noting that authorization of PACE at the state level did not necessarily lead to the development of PACE funds- which local governments rather than states generally implement- but it is a necessary prerequisite for expansion of this financing innovation.

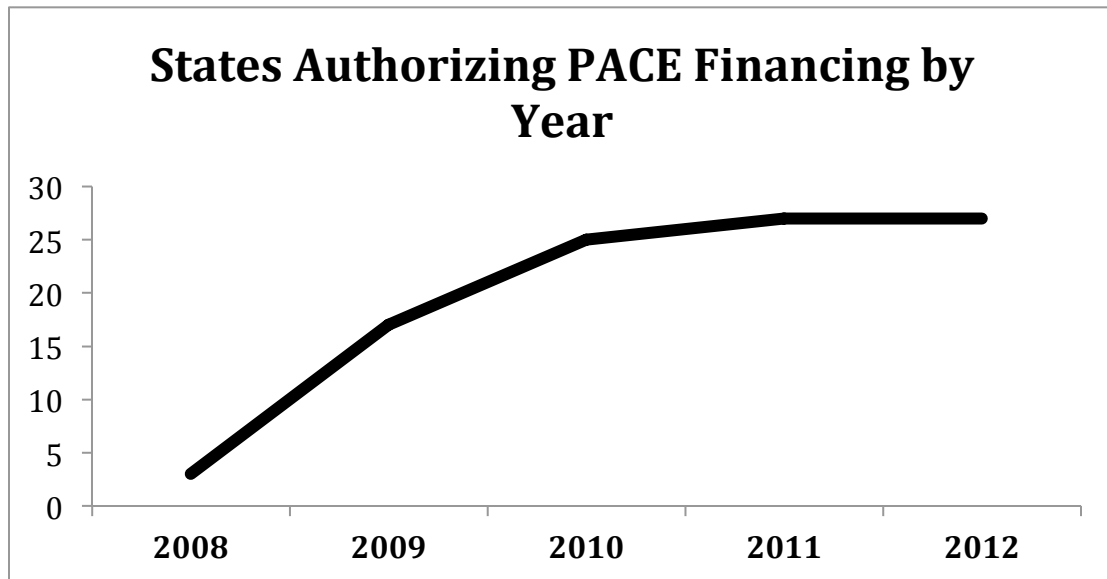


Figure 16- Diffusion of PACE Financing in the States 2008-2012

Statistical analysis provides some insight on the rapid diffusion of PACE parallel to ARRA. The pattern of diffusion was not based on regional determinants. In fact, for the 26 states that adopted PACE from 2008 to 2012 6 each were in the Northeast and Midwest Census Regions, and 7 each were in the South and West regions. More importantly for this hypothesis, it also was not something that laggard states were more likely to adopt to try to close the gap. Although Table 22 shows that more laggard states adopted this policy, it was not a statistically significant indicator. Once again, political culture played a dominant role.

Table 22- Log-Rank Test of Equality of Survival Functions For the Adoption of Legislation Authorizing PACE Financing 2008-2012

Leader or Laggard in 2008	Events Observed	Expected Events
Leader (19 States [^])	12	9.44
Laggard (30 States)	14	12.56
Total	26	
Number of States [^]	49	
chi2(1)	1.41	
Pr>chi2	0.236	

[^]= Hawaii not included because the state had preexisting PACE authority.

To understand the determinants of the adoption of PACE authority, this research includes a 3 variable test of determinants of PACE through an event history analysis, the results are in Table 23 below. Interestingly, the adoption of a complimentary regulation, an EERS, does not increase the likelihood of the adoption of PACE, showing a lack of coordination and policy synergy across market barriers in this regard. On the other hand, even controlling for the average retail price of electricity, as well as EERS policies, Blue States are a dominant determinant for this rapid policy diffusion. Not included in the table is that fact that the governors' party is not a determinant. Thus, this is an isomorphic case where a policy spread among likeminded states in terms of their political cultures.

**Table 23- Event History Analysis of Determinants for the Adoption of PACE
Financing in US States 2008-2012**

_t	Hazard Ratio	P> z	Hazard Ratio	P> z	Hazard Ratio	P> z	Hazard Ratio	P> z
EERS	1.82	0.13					0.83	0.68
Blue State			3.96***	0.00	4.00***	0.00	4.53***	0.01
Average Retail Price of Electricity					1.00	0.98	0.99	0.89
_cons	0.11***	0.00	0.11***	0.00	0.69	0.00	0.08***	0.00
Model Prob>Chi2	0.13		0.00		0.00		0.00	

Number of Subjects	49.00
Number of Failures	26.00
Number of Observations (Time at Risk)	177.00

*p<0.10 ** p<.05, *** p<.01

The development of innovative financing mechanisms during the ARRA period could have allowed states, particularly laggard states, to enhance their clean energy budgets in a more permanent manner. While many states cycled and leveraged funding, most of the SEP resources were a one-time infusion that will not lead to expanded long-term capacity. Thus, any advancement in state energy office financial support through the Recovery Act will be a temporary situation without a further intervention. While programs did not expand, further analysis shows that the gap did not close in a search for best practices among the states.

The Delaware plan for SEP explains how the state designed its new Sustainable Energy Utility (SEU)- created before ARRA but also set up to expand in light of the new resources. In their ARRA SEP plan, the Delaware state energy office writes of its SEU activities:

Many states in the Northeast region consume far less energy per capita than Delaware, in part because they have created aggressive energy efficiency programs. These states include New Jersey, New York and most of the New England states. Research indicated there is a sizable amount of “low hanging fruit” that can be harvested to reduce energy waste. In fact, the cost of saving energy is much lower than the cost of supplying additional energy, making energy efficiency the most cost-effective options. Based on the experience of 6 leading states in the development of energy efficiency programs – California, Connecticut, Massachusetts, New Jersey, New York and Vermont (each of which has operated programs for more than 8 years), University of Delaware Center for Energy and Environmental Policy (CEEP) research estimated the cost of saving electricity to be 3-5 cents per kWh, while electricity typically costs consumers 8-15 cents per kWh. As part of its toolkit, the SEU will also use incentive funds to encourage whole-building strategies to improve energy performance.

Delaware’s plan specifically indicates that it had learned from 6 other leading states in the development of its plans, diffusing those innovations within its borders. After a review of all of the other 49 states’ plans, Delaware is the only state that mentions clear ideas specifically building off leading states. There are a couple of examples of interstate collaboration between leaders and laggards that border one another- Nevada and California in the Lake Tahoe Region, as well as Wisconsin and Minnesota- and an expansion of a partnership between leaders Delaware and Maryland, and laggard Virginia on a Home Performance with Energy Star Partnership that existed prior to the Recovery Act. There was not, however, clear evidence that states that had fallen behind looked to other states on how to operate their programs. There was not a purposeful effort to close the adoption gap and there is not evidence of even a spurious reduction in the policies of laggards and leaders.

ARRA SEP: Learning From the Non-Punctuated Blip

Figure 1 in the introductory sections of this dissertation presented a model of causality for analyzing whether or not ARRA SEP resources, from a competitive federalist perspective, closed the adoption gap. Building codes are a clear example where fiscal federalism and the Federal government's intergovernmental restrictions for receipt of resources pushed late-enactors to advance their regulations where early enactors had done so without the hierarchical federalist pressures. Horizontally, however, the cause of any closing of this gap- particularly related to financing programs- was not laggard states recognizing models of innovation from early enacting states in the establishment of new financing programs. Also, with similar attention to long-term financially sustainable funding mechanisms in leading and lagging states, the long-term gap in financing appears to remain relatively stable. Finally, financing programs grew at the same time outside of the Recovery Act- particularly PACE financing authorization- and there was also an increase in Democratic governorships after the 2008 elections. There are political and industrial differences between the early enactors and laggards- as the next section will show that laggard states are more heavily invested in fossil fuel based industries, and the SEP ARRA could not in itself overcome much of these disparities even as the laggards adopted some of the leaders' innovations.

This analysis is not evaluative of how states spent the \$3.1 billion in ARRA SEP funding. There is ongoing research at the Oak Ridge National Laboratory through OWIP that will provide some of those results, as well as state level reports. Even as there is evidence that the plans missed some of the opportunities that this windfall provided, the failure of laggards to close the gap on leaders does not mean that the spending itself was

a failure. In fact, the next section will show the important shift of clean energy spending as economic development rather than environmental protection during this time frame. Despite the benefits, however, this was not a paradigm shift or policy punctuation, but rather a temporary infusion that helped the states but did not forever alter the policy landscape despite some initial hope of policymakers that this might be just such a moment.

The Recovery Act period ended in 2012. Where there are revolving loan funds, or other forms of innovative financing, however, the money can continue to fuel ongoing state energy efforts. In addition, the attention to opportunities to finance energy efficiency and renewable energy project through mechanisms that leverage tax revenues such as PACE financing or using savings to pay for upfront measures through ESPCs or other instruments will help states with smaller clean energy budgets to overcome financing barriers to the deployment of market-ready green technologies. The Recovery Act did not close a gap in financing, but during this time period there was an advancement in policy innovations that could generate advances in states both leading and lagging to support a low carbon future.

Finally, the Recovery Act's intergovernmental requirements, particularly related to building codes, provided evidence that states are willing to adopt nationalized policy recommendations with the right incentives. One of the reasons why the Recovery Act programs may not have closed the adoption gap between the states and driven innovation was because that was not a specific goal of the ARRA SEP program. Rapid expenditures to generate employment outweighed the development of policy models across jurisdictions that could have brought less innovative states in line with others. The

building code experience serves as an example that 50 governors will likely sign up for an expanded and centralized regulatory regime when there are opportunities for a state-level resource infusion. Future federal legislation and state partnerships can close the adoption gap- if policymakers deem that a desired outcome- with a dedicated effort at equalization and expansion of state energy policy. This, however, also presumes a goal of equalization, which with ARRA, leaders continued to move ahead further pressing an advanced energy economy even if laggards could not catch up.

CHAPTER 7

THE NEXUS OF CLEAN ENERGY AND ECONOMIC DEVELOPMENT

In his book, *The Green Collar Economy*, Van Jones (2008) wrote that green jobs exist in “fields and professions that uplift human dignity and honor the Earth.” Jones indicates that green jobs foster socioeconomic equality. While there is not a universal definition of “green jobs” (NCEP 2009), clean energy and climate protection related employment opportunities generally qualify under broad definitions. As noted in analysis of State of the State Addresses, “green jobs” entered the political lexicon just ahead of the passage of ARRA. The hypothesis under consideration is that justification for climate and clean energy activities in the states shifted from environmental to economic rationales from 2001 to 2012. This analysis will go beyond the words and explain that the focus on energy efficiency generated opportunities for employment and that the focus on energy efficiency over renewable energy after the economic crisis of 2007 helped to provide a worthwhile rationale for technology deployment. The first part of the analysis will explore how clean energy policy can create jobs, while the second part will analyze how the states put these practices into place as rational policy actors promoting state-level interests in a competitive federalism political and economic environment.

A Clean Energy Engine of Economic Growth

The idea of generating jobs and economic growth through energy efficiency and renewable energy is counterintuitive in economics. Displacing cheap fuels and consuming less, on the surface, appears to be a costly means to reduce the size of the economy. Replacing capital-intensive industries with labor intensive efforts and shifting expenditures towards more productive sectors, however, can improve economic outlooks throughout American society. Understanding these shifts is fundamental to understanding green jobs- or any policy induced saved or created full-time employment equivalent- from climate and clean energy policy in the American states.

Most of the analysis of the short and long-term costs and benefits of the transition away from fossil fuels relies on Input-Output (I-O) modeling techniques. Nobel laureate Wassily Leontief (1966) formalized this method of economic analysis based on the “flows of goods” and the “fundamental relationship” of inputs and output in the economic structure. The goal is to study the economy to make better decisions for risky, large-scale capital investments. While Berck and Hoffman (2002) identify other means of analyzing employment effects of relevant policies, they note that I-O models are relatively clear in their application for researchers and widely accepted. Pollin, Heintz & Garrett-Peltier (2010) indicate that the linearity and static nature of these models makes them useful and transparent without too many assumptions or “black box” calculations.

Not all analyses account for the long-term benefits of the energy savings. The New York State Energy Research and Development Authority (NYSERDA, 2008) projects that its “Energy \$mart” program will continue to foster employment through energy savings for fifteen years after the state ends its productive investment, as

consumers will have additional resources to spend on non-energy related expenditures.

As Ayers and Warr (2009) note, American society can better re-adjust its usage of energy to advance economic goals in a more productive manner for labor and income growth.

Beyond just the number of jobs, there is question as to whether these jobs are well-paid opportunities for career advancement for American workers (Mattera, 2009). Van Jones (2008) believes that the green collar economy will foster equity and justice for the working classes. Pollin, Heintz & Garrett-Peltier (2010) have quantitatively determined that green job potential exists for workers of varying levels of education and skill sets, and that green jobs present greater opportunities than other careers with similar skill set requirements. Another consideration, particularly in comparison to this country's increasing dependence on foreign supplies of oil and other fossil fuels in the globalized world, is the domestic nature of clean energy jobs. While many energy efficiency products and services are high in their domestic content and impact, the renewable energy sector in the United States is lagging behind its European and Chinese counterparts in certain technologies. Current policy has not allowed these industries to grow to full potential within the nation's borders (Uchitelle, 2010).

The US economy has undergone structural changes over the course of its history from changes in innovation, technology, demand patterns and other developments. The nation has moved from an agricultural economy to one that focuses on industrial goods and services (Spulber, 1995). Moving from a fossil fuel energized economy to a clean energy economy could be another shift in the American trajectory.

Impact analysis for PLANning (IMPLAN 2011) coefficients for the year 2010, derived for input-output tables, can provide a comparison of the role of improved energy

productivity in industry relative to other sectors for green jobs potential. In order to generate coefficients from the 440 IMPLAN sectors- a proprietary system of the Minnesota IMPLAN Group that maps directly on to the more commonly utilized North American Industry Classification System (NAICS) codes- this analysis requires a bill of goods. As there are not specific codes related to green jobs, efficiency jobs, or renewables jobs, this bill of goods borrows from other classification schemes. IMPLAN reports full-time, part-time, and temporary jobs, but offers data to convert those jobs into full time equivalents (FTEs). The sectors included in the bill of goods for efficiency and renewable energy based on the schemes from Deitchman, Brown, and Baer (2011) and Pollin, Heintz, and Garrett-Peltier (2010) are listed in Table 24. Transparently using these specific sectors offers an indication of the relative macroeconomic impacts of policy-related electricity and natural gas production, consumption, and savings.

Table 24- Bills of Goods for IMPLAN Analysis

Derived from Bills of Goods by Deitchman, Brown & Baer (2011) and Pollin, Heintz, & Garrett-Peltier (2010)

IMPLAN CODE	Aggregation for Fossil Electricity and Natural Gas Related Sectors
20	Extraction of oil and natural gas
21	Mining coal
28	Drilling oil and gas wells
29	Support activities for oil and gas operations
31	Electric power generation, transmission, and distribution
32	Natural gas distribution
206	Mining and oil and gas field machinery manufacturing
428	Federal electric utilities
IMPLAN CODE	Aggregation for Energy Efficiency Related Sectors
34	Construction of new nonresidential commercial and health care structures
35	Construction of new nonresidential manufacturing structures
36	Construction of other new nonresidential structures
37	Construction of new residential permanent site single- and multi-family structures
38	Construction of other new residential structures
39	Maintenance and repair construction of nonresidential structures
40	Maintenance and repair construction of residential structures
205	Construction machinery manufacturing
216	Air conditioning, refrigeration, and warm air heating equipment manufacturing
259	Electric lamp bulb and part manufacturing
260	Lighting fixture manufacturing
261	Small electrical appliance manufacturing
262	Household cooking appliance manufacturing
263	Household refrigerator and home freezer manufacturing

Table 24 Continued

264	Household laundry equipment manufacturing	
265	Other major household appliance manufacturing	
267	Motor and generator manufacturing	
322	Retail stores- Electronics and Appliances	
375	Environmental and other technical consulting services	
376	Scientific research and development services	
IMPLAN Code(s)	Weighted Sectors for Biomass Electricity	Weight
2	Grain Farming	25.0%
15/16	Logging	25.0%
36	Other New Construction	25.0%
115	Refining	12.5%
376	Scientific R&D	12.5%
IMPLAN Code(s)	Weighted Sectors for Solar Electricity	Weight
34/35	Construction	30%
193	Hardware Manufacturing	17.50%
234/245/253/266/416	Electrical Equipment	17.50%
222/244/227	Electronic Components	17.50%
374/375	Scientific and Technical Services	17.50%
IMPLAN Code(s)	Weighted Sectors for Wind and Hydro Power	Weight
34/35	Construction	26%
149	Plastic Products	12%
202	Fabricated Metal	12%
230	Machinery	37%
31	Mechanical Power Transmission Equipment	3%
222/244/227	Electronic Components	3%
374/375	Scientific and Technical Services	7%

Note: Any Sectors Not Part of Energy Efficiency or Fossil-Based Electricity are part of the Baseline Sectors

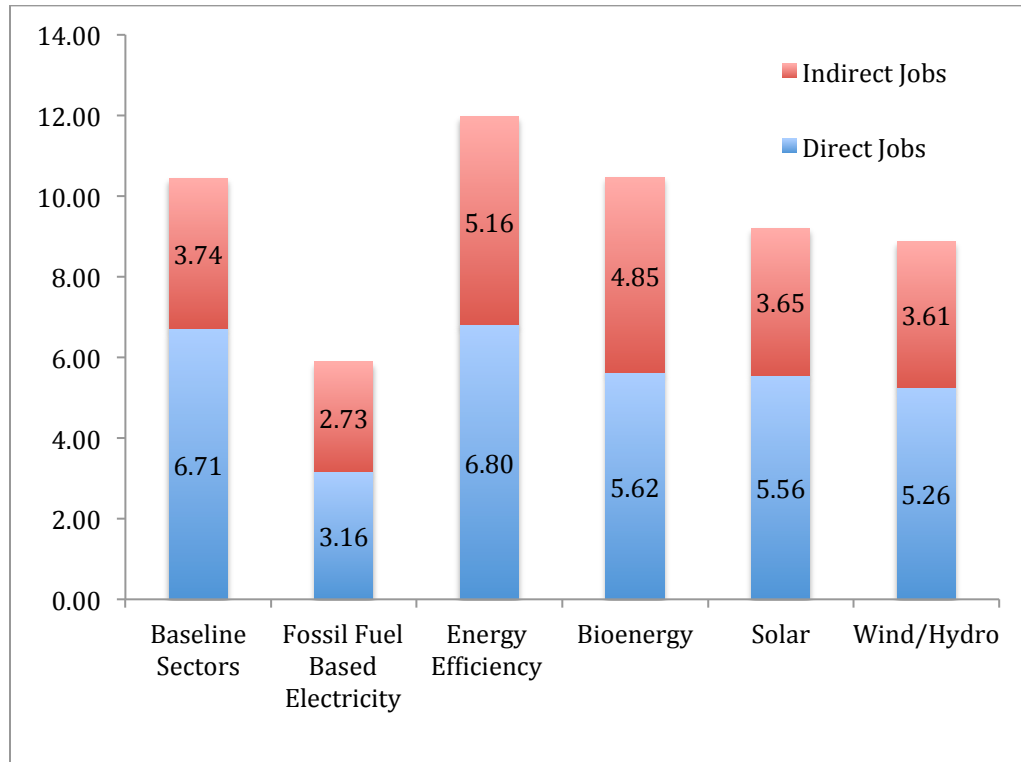
The USA Total File, that is the IMPLAN data for the entire country run through the model, can show us how investment in various sectors can impact the Gross Domestic Product, Employment, and Labor Income. These totals are for direct impact in the sector, indirect impacts where the sector requires purchasing from other sectors, and induced impacts from investment in that particular sector- such as reinvestment of employees of their incomes. As shown in Table 25, a \$1 million investment in energy efficiency products and services generates more economic growth, more jobs, and more labor income than similar expenditures on fossil-fuel based electricity, bioenergy, solar power, wind power, and other productive areas of the economy. In fact, fossil fuel based energy yields the lowest levels of employment and labor income, while the renewable energy sectors result in strong job totals but relatively weak labor income due to lower pay in various agricultural and low-skilled manufacturing sectors that generate the relative employment. In terms of secondary effects, shifting away from fossil fuels, investing in energy efficiency, and allowing consumers and businesses to spend electric bill savings into the rest of the economy could have positive impacts on the entire economy.

Table 25- Total Economic Impacts of Sectors for the Entire USA

Direct, Indirect, and Induced Macroeconomic Impacts Per Million 2010\$	Gross Domestic Product (In Million 2010\$)	Jobs (Total Full-Time Equivalent Job Years)	Labor Income (In Million 2010\$)
Baseline Sectors	\$1.47	16.57	\$0.91
Fossil Fuel Based Electricity	\$1.42	11.47	\$0.80
Energy Efficiency	\$1.53	19.02	\$1.02
Bioenergy	\$1.37	16.19	\$0.85
Solar	\$1.42	15.85	\$0.92
Wind/Hydro	\$1.36	15.23	\$0.87

A further reading into the numbers shows that energy efficiency outperforms other sectors in both direct and indirect jobs. Figure 17 shows that these sectors generate 11.96 direct and indirect jobs per million dollars- outperforming 10.47 in the bioenergy sectors, 10.44 in the baseline sectors, approximately 9 jobs per million in the wind and solar sectors, and only 5.89 jobs in the fossil electricity related sectors. Energy efficiency's direct jobs benefits are particularly of interest for understanding policy impacts in program evaluation. The one caveat is that direct labor income is only 2 cents higher per dollar for investment in energy efficiency (\$0.36) compared to the coal and natural gas related sectors (\$0.34).

Figure 17- Direct and Indirect FTEs Per Million 2010\$ in Aggregated Industries for the United States.



Every state has its own regional economic structure and electricity portfolio.

Wyoming is the largest coal producing state in the nation, while Texas produces- as well as consumes- the most natural gas (EIA 2013). These two states show that even with the importance of fossil energy in their economies, the clean energy sectors are more productive for generating employment per investment than coal or natural gas. That is not to say that coal and natural gas are not important to these states- the fossil energy industry as defined for this work represents 8 percent of employment and 17 percent of output in Wyoming, and almost 4 percent of employment and 10 percent of output in Texas- but the yields on the investment result in a more complex picture for opportunities for further economic growth.

Table 26 shows that investment in fossil energy sectors yields the greatest return on Gross State Product (GSP) within the borders of Wyoming, with 85 cents on the dollar. When it comes to labor, however, the energy efficiency sectors have the strongest job potential and highest levels of labor income per million dollars of productive investment. Table 27 shows similar results in Texas. The values are uniformly highest for Texas due to its larger size, population, and “regional” economy in the IMPLAN nomenclature- thus more money cycles more often within Texas’s border without regional spillover or leakage. While not particularly beneficial to the GSP, Texas’s recent investment in wind and solar could also potentially pay employment dividends, generating similar jobs levels to the baseline sectors.

Table 26- IMPLAN Coefficients for Wyoming

Direct, Indirect, and Induced Macroeconomic Impacts Per Million 2010\$	Gross State Product (In Million 2010\$)	Jobs (Total Full-Time Equivalent Job Years)	Labor Income (In Million 2010\$)
Baseline Sectors	\$0.74	10.13	\$0.44
Fossil Fuel Based Electricity	\$0.85	5.54	\$0.44
Energy Efficiency	\$0.73	10.60	\$0.54
Bioenergy	\$0.49	9.76	\$0.28
Solar	\$0.46	6.01	\$0.32
Wind/Hydro	\$0.65	7.61	\$0.43

Table 27- IMPLAN Coefficients for Texas

Direct, Indirect, and Induced Macroeconomic Impacts Per Million 2010\$	Gross State Product (In Million 2010\$)	Jobs (Total Full-Time Equivalent Job Years)	Labor Income (In Million 2010\$)
Baseline Sectors	\$1.07	11.60	\$0.63
Fossil Fuel Based Electricity	\$1.13	6.58	\$0.59
Energy Efficiency	\$1.07	13.93	\$0.74
Bioenergy	\$1.01	14.49	\$0.58
Solar	\$1.03	11.93	\$0.67
Wind/Hydro	\$0.97	11.17	\$0.63

Coal and natural gas are integral parts of the economies of Wyoming and Texas respectively. Any displacement of these resources will have impacts on these states without an expanding role for other industries, be they clean energy or in other parts of the economy. A shift from fossil resources to clean energy resources, however, could help to improve the employment situation in these jurisdictions at similar levels of investment. In sum, Wyoming and Texas have coefficients that do not differ too markedly in terms of jobs per million by sector from the country as a whole.

One final point of comparison is for the laggards and leaders as defined in the previous section of this dissertation. On the descriptive statistics, the 30 laggard states are home to 48 percent of the GDP and 52 percent of the population and employees of the nation. The laggard states, however, also account for 72 percent of employment in the fossil fuel sectors and 66 percent of output in those sectors. Due to the different size of the leader and laggard economies in IMPLAN, the analysis compares industries within the IMPLAN regions to the baseline of aggregated sectors that do not include the fossil fuel sectors or the energy efficiency products or services sectors.

Overall, the leaders and laggards generate similar coefficients for direct multipliers for the five relevant sectors compared their relative baseline sectors. The focus here is on direct multipliers due to the dispersed and disparate leader and laggard “regions.” Table 28 shows that while fossil fuel based sectors can generate the greatest economic growth per million dollars of investment, energy efficiency expenditures facilitate employment at levels similar to the baselines, and solar and energy efficiency sectors can lead the most income for labor.

Table 28- Direct Effect Coefficients for Five Defined Energy Sectors as a Percentage of Baseline Sectors from 2010 IMPLAN Data

Laggard States	Gross Regional Product	Jobs	Labor Income
Fossil Fuel Based Electricity	122%	36%	85%
Energy Efficiency	80%	100%	104%
Bioenergy	77%	89%	87%
Solar	85%	82%	105%
Wind/Hydro	78%	76%	95%
Leader States	Gross Regional Product	Jobs	Labor Income
Fossil Fuel Based Electricity	112%	29%	61%
Energy Efficiency	83%	98%	113%
Bioenergy	73%	79%	84%
Solar	84%	80%	103%
Wind/Hydro	76%	77%	94%

Figure 18 highlights the one place where there is a disparity in the numbers for leaders and laggards- labor income in the fossil fuel electricity sector is much higher in the laggard states. This is not enough of a disparity to explain the differences between leaders and laggards, but, as indicated above, there is a relationship between the size of the fossil fuel based economy and the interest in states shifting their economies away

from fossil fuels. While energy efficiency and solar energy jobs may better serve the cause of increased labor income in laggard states, the status quo of coal and natural gas paychecks may not justify a low carbon shift in certain places. It is worth considering, however, that these industries are capital intensive, but not labor intensive. While the gross regional product coefficient is 1.2 times the baseline, the number of full-time jobs created or saved directly is just over a third of the baseline for similar levels of investment. Jobs and growth in these sectors are not always synonymous.

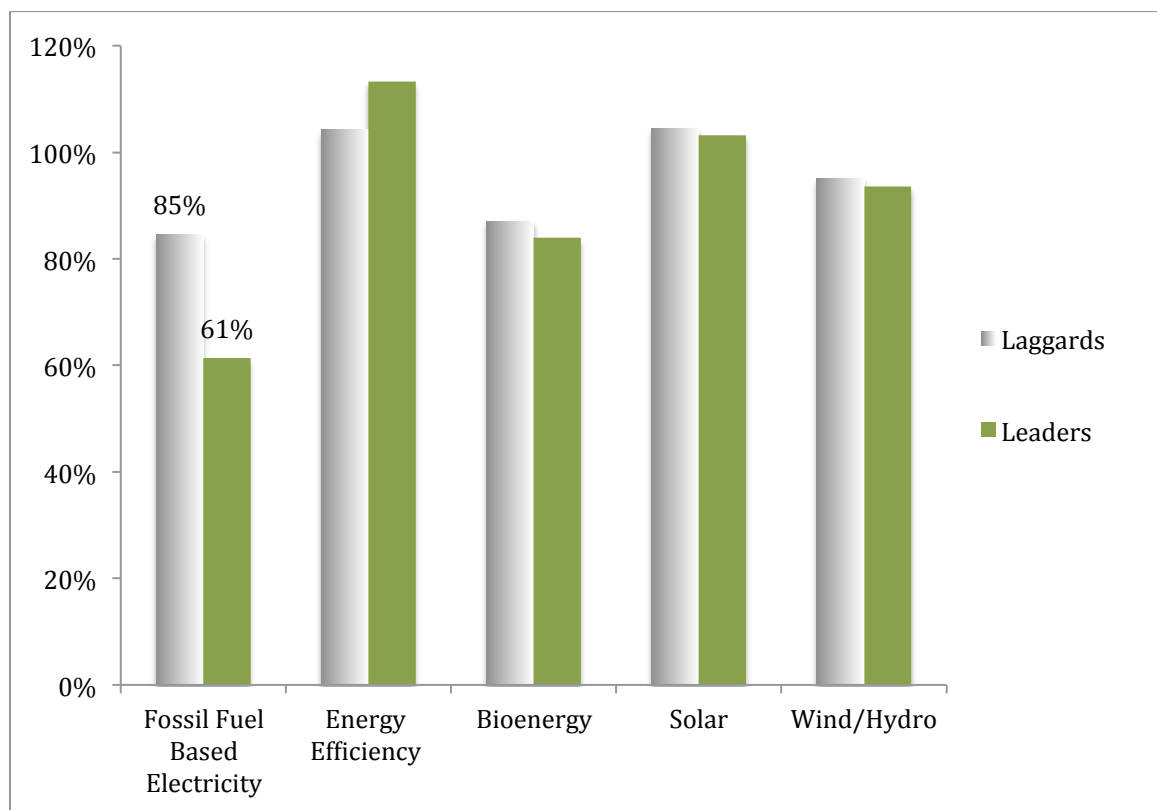


Figure 18- Direct Effect Coefficients for Five Defined Energy Sectors as a Percentage of Baseline Sectors from 2010 IMPLAN Data for Relative Labor Incomes

All of these metrics show that there are significant potential macroeconomic benefits- particularly in light of high employment across the country- to green jobs related programs. Chapple et al. (2011) show that regional innovation systems defining clean energy industries within a state facilitate business entrepreneurship and corporate

innovation in these sectors similar to other technology sectors. American states can be at the forefront of the clean energy economy. The next section explores this aspect of the rationale for clean energy policy.

The Economic Policy Rationale

As noted early, the ARRA SEP was about expanding clean energy programs in the states for job creation; and the states responded with programs laden with job creation and retention goals. Not all states maximized the immediate employment potential of clean energy investments. Tennessee, for example, invested all of its approximately \$62.5 million share of ARRA SEP into the state's solar initiative. As indicated through input-output analyses reported in Table 29 based on the 2010 IMPLAN data- which differs slightly from Tennessee's self reported metrics in its application, Tennessee could have generated 188 more job years and \$2 million more in GSP and labor income if it had invested in energy efficiency sectors.

Table 29- Input-Output Analysis of Tennessee's Potential ARRA SEP Investments

Impact of \$62.5 Million in Federal Stimulus (Direct, Indirect and Induced)	Gross State Product (In Million 2010\$)	Jobs (Full Time, Part Time, and Temporary)	Labor Income (In Million 2010\$)	Labor Income Per Job (In Thousand 2010\$)
Solar Energy Sectors	\$57	791	\$39	\$49
Energy Efficiency Sectors	\$59	907	\$41	\$45

Despite the lack of immediate optimization in employment opportunities through the funding, the Tennessee plan was bullish on its economic development potential. Collaborating with Oak Ridge National Laboratory and the University of Tennessee, the state energy office hoped to rapidly develop a mature solar energy industry that could support in-state generation and become a leader in this technology. While the majority of Recovery Act funding under SEP went towards energy efficiency projects, ranging from Tennessee's Volunteer State Solar initiative to Pennsylvania's Clean Energy Works and other programs across the country, the economic development potential of clean energy

was evident in the plans. One interesting note from the Tennessee example is that the labor income per job in solar was \$4,000 more than in energy efficiency. That said, the economic development potential of energy efficiency and renewable energy is about more than input-output metrics.

Beyond the types of policies the question at hand is how states sold these policies over time. Figure 19 shows the temporal nature of climate and clean energy topics in state of the state addresses. As noted earlier, green jobs were a new idea to enter the political lexicon in time for start of the year in 2009, when governors deliver their annual or semi-annual address. Green jobs topics did in fact rise as discussion of climate change dropped from its peak in 2009. This, however, does not show a shift in any sort of trend, although it is interesting to witness the rise of these topics in the middle of the 2000s decade and the fall at the end of the decade. Figure 20 shows that despite the broad shift for governors, public opinion on this issue for the relevant remained relatively steady throughout the period under consideration. Although the Pew Research Center's (2013) surveys focused on the federal level and was not complete for every topic across the time period, it shows some degree of stability in public opinion about energy, the environment, and climate change, despite shifts in energy prices, environmental awareness, and changing beliefs about the importance of job creation in light of the global financial crisis. Whatever the policy area, the agenda for the present day is jobs, jobs, jobs.

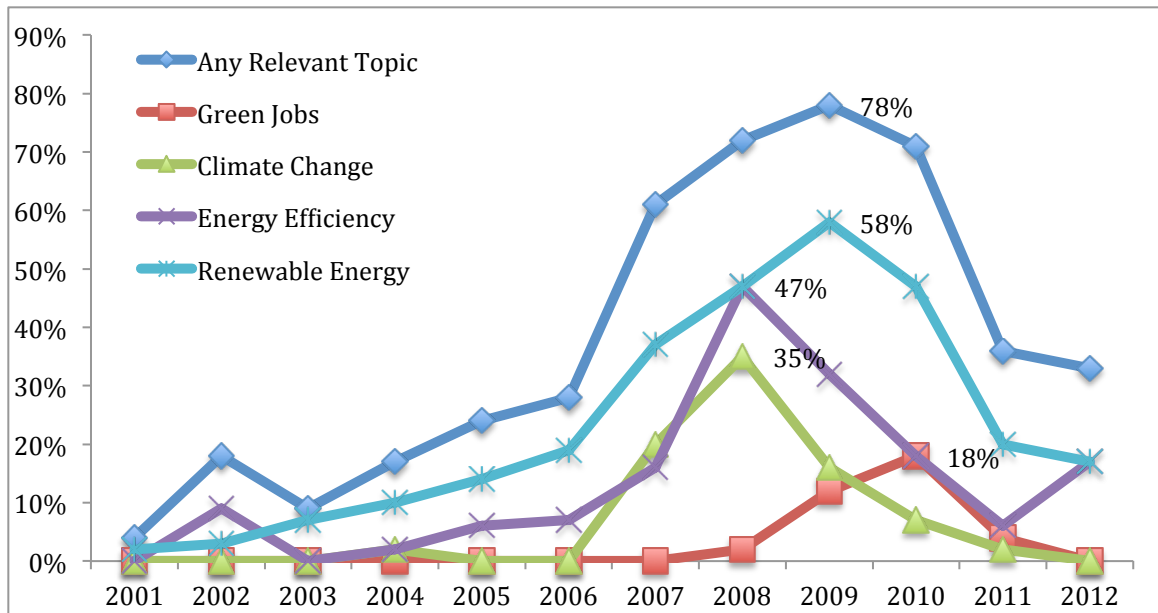


Figure 19-Gubernatorial Climate and Clean Energy Related Topics in State of the State Address By Percentage of Speeches 2001-2012

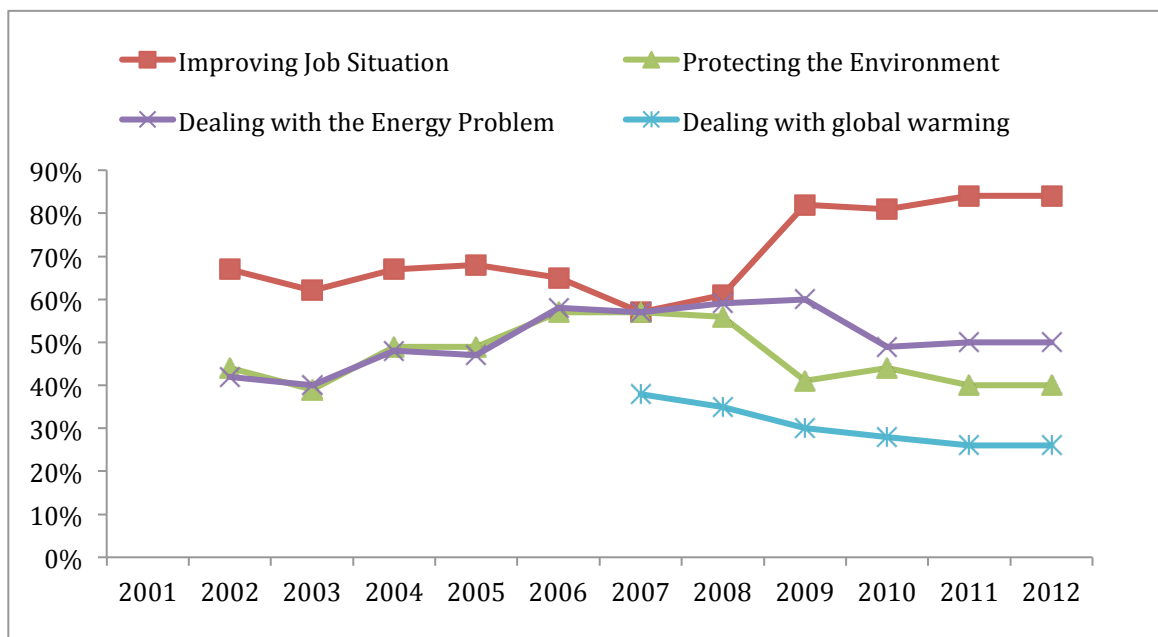


Figure 20 – Public’s Federal Policy Priorities (Pew Research Center 2013)

The temporal data shows increased attention to climate and clean energy issues throughout the ARRA period. Figure 21, however, shows that the peaks in attention in State of the State Addresses to this policy domain also align with the peaks in Democratic

control of state chief executive office. In fact, the aftermath of the 2008 elections was when the Democratic Party was at its highest electoral level during this time frame in governorships, Congressional seats, and control of the White House.

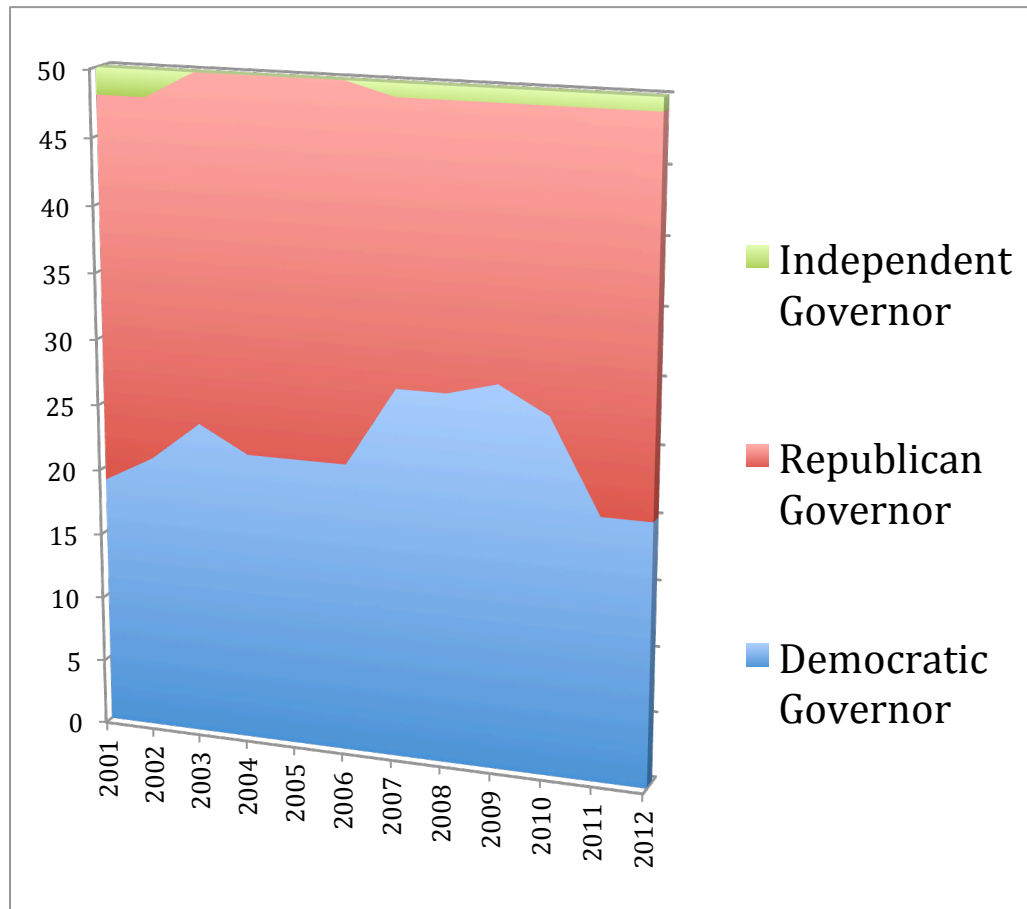


Figure 21. Party Control of Governorships 2001-2012

Economic development opportunities are the most prominent rationale for climate and clean energy policy. The IMPLAN-based input-output coefficient indicate that energy efficiency in particular, but also renewable energy technologies, are superior dollar for dollar for job creation and labor income in comparison to the capital-intensive but low employment productivity fossil fuel sectors. There is not, however, evidence of a specific shift- the "green jobs" rationale was always there even if the term "green jobs" was a new development in the latter third of the time period in question. In a period of

financial crisis and Democratic political dominance, political leaders were able to make a case- a case empirical supported through macroeconomic analysis of labor productivity of investments- that there was a jobs co-benefit from relevant policies.

As with the other hypotheses under consideration in this paper, one could parse the data to find examples of a broad shift in rationale from the environmental to the economic considerations of climate and energy policy within this time frame. Looking at the whole of the states from 2001 to 2012, there is not enough evidence to accept the hypothesis at hand. In fact, the energy challenges, climate change, and economic situation as rationales synergized and negated one another depending on the characteristics of the situation in innovation in climate and clean energy policy. Despite the lack of clear trends in politics, economics, or rationales for policy, there is a competitive federalist story in the political, academic, and media consensus of states as leaders in this policy domain, related primarily to ideological rather than fiscal divisions.

CHAPTER 8

CONCLUSIONS: COMPETITIVE FEDERALISM AND SCALE-MATCHING

“Democratic Governors: The States Must Lead On Climate Change” was a front-page headline on the popular content aggregator and purveyor of popular culture Buzzfeed.com on March 2, 2013 (Cramer 2013). The article notes the gridlock in Washington and the success of Democrat governors in pushing climate change policies- and a lack of such policy positions among Republican governors- as the reason for the necessity of such leadership. The policy experiments in Democratic leaning states have produced clean energy deploying results over the past decade, but the idea that states “must” lead may well be overstating the role and purpose of states in the competitive federalist environment outlined in the Constitution.

In fact, much of the leadership the state governments exhibit these days is leadership of the debate of the status quo in Washington. Brandeis’s laboratories of democracy remain democratic, but the current state of American democracy has morphed them into laboratories of opposition. With federal leaders slow to act on immigration enforcement, conservatives turned to the State of Arizona to implement reforms. With federal leaders slow to act to reform drug laws, liberals pushed referenda in Colorado and Washington State that legalized marijuana. With federal leaders slow to act on climate, states that tend to vote for Democrats for president enacted efforts to promote clean energy and greenhouse gas mitigation strategies.

The laboratories of opposition are not veto points and the politicians operating these laboratories are not looking to create filibusters or cause gridlock. While senators

voice their objections through votes and statements, governors are confronting the federal realities through policymaking. Unlike a parliamentary system, the United States does not have a formal opposition, opposition leader, or shadow government. The politicized competitive federalist system, however, allows for a distributed opposition to frame alternatives to federal policymaking. Unlike a shadow government, however, the state opposition can legitimate and implement an agenda to provide successful policy outcomes and encourage innovation.

Despite the clear vertical tensions between the state and federal governments, and the partisan tensions among the state and federal officials competing for power and authority, the system spurs innovation. The innovation is rooted in partisan ideologies and may miss economic opportunities due to competing values, but the experimentation in the democratic laboratories of opposition is also finding creative and flexible means to achieve the multiple goals of the pluralistic interests across the United States. Many of the innovative financing mechanisms rapidly spread across receptive states because they combine concern for the environment with concern about economic development. Interested states are an effective venue for facilitating the expansion of energy savings and carbon dioxide reduction programs that the federal government does not have the will or ability to enact.

The federal government is an enabler of this system not just in its failures, but also as a purposeful strategy. Washington learns from the states and when leaders in Washington recognize their shortcomings or want to oppose their own status quo, the states are a venue for their dissent to create new opportunities. While President Obama has called on the federal government to raise the minimum wage, he praises the states

that have increased the requirements of this regulatory floor and used their evidence to push his agenda. The stimulus funding for energy to the states provided the laboratories new resources to turn the opposition into action with a Democrat now in the Oval Office. Competitive federalism in the modern partisan battleground may not carry the same conceptualization of a previous more fiscal focused era, but the failure of these hypotheses to hold opens a new line of research and a new venue for actors in the policy process to seek change.

The first hypothesis did not show a national, bipartisan network of ambitious, entrepreneurial governors drove climate and clean energy policy innovation from 2001 to 2012. There were not statistically significant relationships in the event history analyses of both adopted policies and policy proposals to conclude that governors that had further Federal executive ambitions pushed or adopted a climate and clean energy policy. While there was a group of governors at the National Governors Association that helped advance this policy domain within their own states and on a national scale, the strongest determinants of the policy agenda and policy legitimization were partisan variables- political culture as defined by the Red State/Blue State dichotomy or gubernatorial party. It was not bipartisan.

The second hypothesis could not establish a causal relationship that the State Energy Program Recovery Act resources reduced the policy adoption gap between early enactors and laggards in clean energy financing and regulation. In order to analyze the second hypothesis, a new index of State Energy Program under ARRA related policies- including regulatory requirements, the size of financial incentives for clean energy, and actions to mitigate climate change- divided 20 pre-ARRA leaders from 30 laggards.

While laggard states did upgrade the stringency of regulations in response to ARRA requirement, particularly for building codes, the content analysis of SEP plans did not find, from a horizontal competitive federalist perspective than the cause of any closing of this gap- particularly related to financing programs- was not laggard states recognizing models of innovation from early enacting states in the establishment of new financing programs. There is a correlation, but not a causal relationship based on the model in Figure 1.

Economic development opportunities are the most prominent rationale for climate and clean energy policy. The IMPLAN-based input-output coefficient indicate that energy efficiency in particular, but also renewable energy technologies, are superior dollar for dollar for job creation and labor income in comparison to the capital-intensive but low employment productivity fossil fuel sectors. The empirical evidence across the period for the third hypothesis, however, did not reveal a shift, as economic considerations were always on the agenda and the statistically significant politics variables across the analysis, as well as the structural energy economics of the state that do not easily shift- particularly the presence of a large fossil fuel industry that dominates many states- strongly impact the agenda and policymaking decisions.

Despite the lack of affirmative conclusions with regards to these hypotheses, there are clear lessons for scholars and practitioners of climate and energy policy and public administration. The ideological battles that have been hallmarks of federal policymaking are also a part of how states conduct business. Governors need not have national ambitions to set policies consistent with their respective states' federal partisan preferences in the climate and energy subsystem. The fact that politics shapes policy is

not news, but the fact that politics is overshadowing economic opportunity challenges notions of rational policymaking. Reconsidering the drivers of competition and policy adoption established in Figure 2 the other political and economic aspects take a back seat to partisan values in this domain.

In the laboratories of opposition state governance has become intertwined with Federal policymaking. When the Framers drafted the Constitution the concepts of global commons problems and a diverse country of 50 states from coast to coast and beyond with over 300 million were likely not at the forefront of their thoughts. State rebellions, however, were a consideration. The opposition in policymaking for climate and clean energy is not a rebellion or revolution, but it is a case where states are making a case against one another and federal decisions. Whether or not state policy should be a referendum on national policy it is a fact of life in a country with deep social divisions over marriage, drugs, and values. It may be less obvious, but fiscal and environmental issues are not part of these divisions and are factors in modern federalism. Federalism may work best when the competition is based on rational economics, but today is a politicized age with politicized competitive federalism. Although there are problems with entering into the most divisive politics of the day, the benefit has been successful policies and models of innovation in receptive states across the nation.

For those who seek more stringent climate change regulations and promotion of clean energy policy, there are options to help close the adoption gap as outlined in the function in Figure 1 beyond the ideal of changing political values. Of particular interest is capacity. While a quick infusion of resources could not drive the laggards towards leadership, continuing to build the bureaucratic infrastructure within government and

through public private partnerships can have strategic benefits. Capacity can support long-term change when future opportunities arise to meet climate challenges.

A major issue to consider in the wake of failure to establish a bipartisan consensus and coherent policy towards climate change and clean energy deployment is one of scale. Global climate change and energy problems are worldwide challenges that will require long-term solutions. States are able to make an impact, but their borders and authorities only stretch so far. The vertical competition between states and the federal government is unequal with the federal government's superior resources. In addition, as the results of this study show, the shifts over time on ideas about climate and clean energy among state executives are rapid. Year in and year out there are new paradigms and beliefs about these challenges in light of the political and economic context of the day. While the federalist system is stable, the changing dynamics and even personalities of the leadership are highly variable. There are not broad generalizations about why states lead in this domain beyond long-term partisan differences.

Despite the hypotheses notwithstanding the multiple methods of analysis, this research makes useful contributions to an understanding of state energy policy leadership. The importance of political variables, while not unexpected, reveals that it was governors in Blue States or from the Democratic Party or with both the political culture and party label of the left-wing of American politics were the leaders. In addition, the new index of leaders and laggards reveals that the economic structure of the state, again unsurprisingly, is a major determinant of climate and clean energy innovation. Finally, the new results on green jobs, particularly related to labor income, can help guide policy makers in their

policy designs to expand economic development through energy efficiency in the post-ARRA era.

In a nation with variable constituencies, industries, and values, a system that allows for equal variability in policy by state can lead to popular and successful outcomes. Competition in the marketplace of ideas and policies among rationale actors can facilitate innovation. The authors of the Constitution did not envision state-level leadership in long-term technology initiatives. While the states have gone above and beyond in this area, the status quo policy stasis at the federal level with leadership within constraints in the states can only go so far in truly solving the circumstances that modern society faces through a comprehensive approach.

The conclusion of this work leaves a further research agenda to pursue. A clear definition of laboratories of opposition within this policy domain and into other areas of competitive federalist policy interventions will help further understanding of modern institutions. In addition, as this study focused a Recovery Act program planning, a look into the evaluation of these programs will provide additional data to, in particular, understand the bills of goods that define the clean energy economy. Case studies of the established leaders and laggards and international comparisons with other federalist democracies facing the same challenges will provide counterpoints to the broad American experience. Contemporary approaches to federalism and polycentricity to address the problems of climate change and global energy security require further analysis of the politics, economics, and competition that drives the agenda setting and legitimization of these multidimensional policy problems. To paraphrase former Governor

Arnold Schwarzenegger in his signature acting role: when it comes to further studying these areas upon completion of this dissertation: we'll be back.

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VITA

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